

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.  
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## Flight

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### CONTENTS.

	PAGE
Editorial Comment :	
The German Defeat in the Air .. .. .	1213
The Threat to Germany .. .. .	1214
Germany and the Future of the Air .. .. .	1216
The Madness of Trades Unions .. .. .	1216
The 200 h.p. Austro-Daimler Aero Engine .. .. .	1217
The Royal Aero Club. Official Notices .. .. .	1223
The Roll of Honour .. .. .	1224
The Austrian Berg Single-Seater .. .. .	1225
Airisms from the Four Winds .. .. .	1228
Personals .. .. .	1231
Aviation in Parliament .. .. .	1232
Steel Tubes, Tube Manipulation, and Tubular Structures for Aircraft. By W. W. Hackett and A. G. Hackett .. .. .	1233
The Royal Air Force .. .. .	1236
Aircraft Work at the Front. Official Information .. .. .	1238
Side Winds .. .. .	1240
Company Matters .. .. .	1240

## EDITORIAL COMMENT.

" Newspapers are an essential part of our war organisation."  
(Sir Auckland Geddes, Minister of National Service.)

**H**OW far the defeat of Germany in the air has conduced to the appeal for the cessation of hostilities we cannot fully appreciate as yet, but it is certain that it has been responsible in no small measure for the difference of tone between now and the opening of the great enemy offensive in March.

At that period we had not really established any marked superiority in the air. We had held our own, and even at times we had been

**The German Defeat in the Air** superior in fighting strength but our superiority was always in the balance, and as we know, was liable to be reversed as the fruits of new enemy

programmes began to be seen. The shortage of material had not made itself decisively felt on the German construction programme, while our own advantages of both material and personnel had not become completely effective. When, however, the great enemy drives towards Paris and the coast

ports had been definitely stopped, these factors began to exercise their full influence. It is beyond doubt that Germany made her last effort during the winter to amass a sufficient superiority of men and material to make possible the ultimate bid for victory. It was all or nothing. She realised to the full that on the fall of the dice depended the fate of the war and she strained every nerve and every resource to ensure that they should fall as she desired. How nearly she came to consummating her object we do not, possibly, know yet. But as we know she failed and the effort left her exhausted as to resources, while our own were only beginning to be fully availed of, and the result has been seen during the past three months, in which we have seen a complete reversal of the military position.

In order to appreciate the character of the air fighting during that period it is only necessary to glance at the official record of the numbers of enemy aircraft destroyed on the British Western front. In June 293 German machines were destroyed and 124 driven down out of control, at a cost of 108 British machines missing. In July we destroyed 294 and drove down 82, with a loss of 131 machines. During August our airmen destroyed 467 and drove down 194 German aeroplanes, while we lost 193. The figures for September were 389 German machines destroyed and 159 driven down, our own tale of missing being 236. The totals for the four months, then, are: enemy machines destroyed, 1,443; driven down out of control, 558; British machines missing: 668. Thus we see that the British R.A.F. alone accounted for some 2,000 enemy machines. In addition to these, units of the Independent Air Force and the coastal squadrons destroyed a further number of German aircraft, and the French and American air forces inflicted severe losses. What these amounted to we cannot say, but they certainly must have been a substantial addition to the casualty bill. The effect was seen in the middle of August, when the enemy adopted the new tactics of defence in large formations at selected points and almost abandoned offensive action. It is clear that this was forced upon him by the strain imposed on his resources by the heavy drain on material and trained personnel. Whatever the sum total of his losses may have been, the important point is that he was losing machines and pilots at a much faster rate than he could replace them.

# The Threat to Germany

We know that the one thing more dreaded than anything else by the Germans was the threat of air attack on the industrial towns of the Rhine Valley. They have never made any secret about their fear, and the only consolation they have been able to get is in the belief that we should not be able to make good our intentions of carrying the air war into Germany. As to that, they have been rudely and progressively undeceived. In June we dropped 66 tons of bombs on German towns. In July this increased to 81 tons; in August to 100 tons, and in September to 178 tons. That is to say, in four months we roughly trebled the intensity of the attack and are increasing it all the time. Moreover, the abandonment of the Belgian coast by the enemy and the pressing back of his line has vastly increased our own facilities for raiding Germany, while his own offensive power has been steadily diminished by the loss of a number of his principal aerodromes. The full effect of these losses is not apparent until we remember that the Germans had concentrated large defensive formations to the south of Luxemburg for the protection of the industrial area north of Cologne. This area has, up to the present, been comparatively immune from attack because hitherto it has been necessary to launch our air raids from the sector between Verdun and Nancy. Obviously, the shortest line to Essen, Elberfeld, Barmen, Krefeld and to Berlin itself is from Belgium. So long as the area lying east of the Belgian coast-line was in enemy occupation we could not take advantage of this shorter road to the interior of Germany. Furthermore, our raiding squadrons were always open to attack from both flanks, owing to the German concentrations in Lorraine on the one hand and in Belgium on the other. Now that we have regained a large area of Belgium, including the whole of the coast-line, we are able to take full advantage of this short line and under better tactical conditions. There is nothing now to stop us from continuing the policy we have adopted towards the more southern towns of the Rhineland right up to Essen, and possibly as far afield as Berlin, while, as we have already pointed out, the attack grows in strength and intensity every day.

The Germans realise this as well as we. In fact, it is probable from what we know of the Hun psychology that they realise the possibilities far better. We have heard the howl for pity and Christian feeling which has gone up as a result of what we have already done, and we are listening for the scream that will follow the extension of our policy of air attack on the great industrial and munitions centres. The morale of the German people has fallen very low, as we know, and their authorities do well to regard with misgiving the probable results of another month or two of persistent attack from the air. Defeated all round, and with her allies falling away from her, it is no wonder if the actual and prospective results of the war in the air have supplied one of the most potent arguments leading up to the peace move.

# Germany and the Future of the Air

In the course of the discussions that have ensued upon the German request for an armistice to talk about the terms of peace, we have heard a great deal about the "freedom of the seas" and the necessity of keeping Germany out of mischief by depriving her of the power to wage

war against our sea communications. We need hardly say that we are in the most complete agreement with the views of those who hold that never again can we trust the Hun with the means of potential mischief. It was because we feel so strongly on these points that we went out of our way to write on the subject of a future submarine war against the world's maritime traffic and reproduced a chart showing how the old German colonies covered the whole of the great traffic routes of the seas. But while we are talking about things that are tangible because we know by experience to what an extent they count in the future peace and security of the world, it will not do to ignore other potentialities of which we know less. We intend—at least, British public opinion intends, whatever may be the views of the Government of the day—that Germany shall not be given any *point d'appui* which she can use as a means for once more warring against the peace of the nations. She is not to be allowed to re-establish overseas naval bases.

Now, we may be indulging in the intelligent anticipation of events which is so disliked by the censor and others, but we shall be astonished if the naval requirements of an armistice do not include the surrender of the German fleet, including the submarine flotillas, and the German mercantile fleet. Anything short of this would be a crime against future civilisation. Certain units of both may ultimately be handed back to Germany, but that is a thing apart from the initial terms of the armistice. Then, the military terms will probably be no less stringent. Whatever those terms may be, we may be certain that they will substantially represent the main lines of the peace settlement and that what we do not secure by the armistice we shall not secure at all. That is a point of view we have given expression to before, but it will bear repetition. As we have said, we have heard all about these matters, but so far we have not seen any expressions as to the future of Germany in the matter of air power. We believe that, great as the advances in aviation of the past four years have been, they are only the beginnings. As a matter of sober fact, we none of us know what developments the future has in store. Air power in the hands of an unscrupulous nation like Germany has shown herself to be may well develop into a far more serious menace than the submarine has been in this war. To follow the argument along its most logical lines, unless we lay down now what we intend that Germany shall be allowed to do in the air it will be too late in two or five years from the present. Unless we say what we mean and include it in the peace settlement it is not at all impossible that we may find ourselves faced with a serious dilemma later on. Let us suppose that Germany, adhering to the letter of the peace treaty, should reduce her army to a police footing; reduce her naval programme to the barest necessities; and abandon altogether the use of the submarine, she would, however, be free to concentrate all her resources for war on the construction of a great air fleet, and could, when taken to task by the other Powers, plead that there was nothing in the treaties precluding her from doing exactly as she pleased in her aerial policy, and in any case she was only building for commercial purposes. We should then have the two alternatives of accepting the explanations offered and of building to meet the menace, or of treating the matter as an immediate *casus belli*. If, however, we take the strong line now,





AT THE "SIGN OF THE AIRSHIP" IN THE TRAFALGAR SQUARE RED CROSS CAMOUFLAGE FAIR.—Top, left: W.R.A.F.s inviting a shower of pennies with which to cover the Red cross on the ground. Top, right: Airship girls who collected. A group of girls [from Spencers, the] balloon makers. On the right, Mr. Entract, Mr. Roth and (in soft hat) Mr. Allen (Managing Director of Spencers); on left, Lady Sybil Grant (a daughter of Lord Rosebery), Mrs. Strickland and Admiral Parry. Below, left: A few of Armstrong girls from Newcastle among the "ruins" of Trafalgar Square. Below, right: Beardmore girls from Inchinnan, who also joined in collecting "siller" for the good cause.

while we have the opportunity, we can place the matter beyond all controversy. That should certainly be done, and the same guarantees insisted upon as will be demanded in the case of the German navy and the army.

**The Madness of Trades Unions** "Whom the gods wish to destroy they first make mad," runs the proverb, and it really begins to look as though the initial stages of madness had seized upon the trades unions. We are greatly minded to this reflection when we study the genesis of the trouble which has occurred at the National Aircraft Factory at Aintree. It seems to have begun twelve months ago when the Ministry of Munitions established standard wages, rules and conditions for skilled aircraft woodworkers, on the understanding that all systems of payment by results then in existence should continue, and that new systems agreed to by the workpeople in any particular establishment would be approved and supported by the Minister.

Questions have since arisen between the National Aircraft Committee and the Ministry as to the application of this understanding to new systems and to their relative positions on the matter. Those questions have been recently referred to the Executive Councils of the various woodworking trades unions with a view to a further conference between the Ministry and the National Committee. Without awaiting the issue of these negotiations, and against the advice of the National Aircraft Committee, certain of the unions and the Liverpool District Aircraft Committee have precipitated a crisis by threatening a strike and the expulsion from their trade unions of members participating in the system of payment by results introduced by desire of the men and with their practically unanimous approval at the Aintree factory. The men in the factory have represented to the Ministry that they wish the system to continue.

In those circumstances the Ministry has had to declare that any persons participating in any illegal action in connection with the system at the national factory will be proceeded against, and the Ministry will be compelled to enforce the reasonable policy to which it is committed of supporting the workpeople in any other district who have by mutual consent adopted similar systems of payments, as in Manchester, where a system of payment by results is being attacked.

On Clyde-side also eighty joiners working at Messrs. Yarrow's Scotstoun yards on a "premium bonus" system have been induced by the local trade union officials to leave work of urgent national importance, and the Admiralty have notified the Society of Carpenters and Joiners that they will be compelled to take such measures as are open to them unless the action of the local officials is revised.

We confess ourselves utterly at a loss to understand the attitude of the unions. Are we to understand that by their constitution they are really protectors of the inefficient and the slacker? Unless that is accepted as the explanation we fail to understand why they should attempt to stand in the way of the good workman turning out as much work as he is capable of doing and reaping the results of his industry in better wages. Nor do we fully appreciate the standpoint of the workers themselves. Here we have a majority of 362 to 21 in favour of the system of payment by results. Yet, apparently, that majority is willing to down tools at the behest of the union officials for the very purpose of defeating what they are overwhelmingly in favour of continuing. It beats us completely.

We have always been in favour of sane trades unionism, which we hold to be to the advantage of both employer and employee, but we are by no means in support of trades unionism run mad, as it has unfortunately done in very many directions during the war. On the one hand, we have seen workers in essential industries ceasing their employment in direct opposition to the advice of their leaders and against all the dictates of interest and common sense. On the other, we have had the spectacle of men and women "downing tools" at the orders of their officials even when the line laid down by the latter is in contradiction of that adopted by the workers themselves. It all leaves the plain person absolutely bewildered, and we say with all seriousness that if trades unionism cannot do any better than this it is time it ceased to exist and something better was put in its place. Clearly, the future of industrialism in this country cannot be left to be the plaything of the irresponsible. That future is far too grave and full of difficulty for that to be allowed. What the remedy is we are not prepared to say for the moment, but it is perfectly obvious that if trades unionism is to continue and to command the confidence of the community it will have to be seriously overhauled from inside.



L.F.G. CII

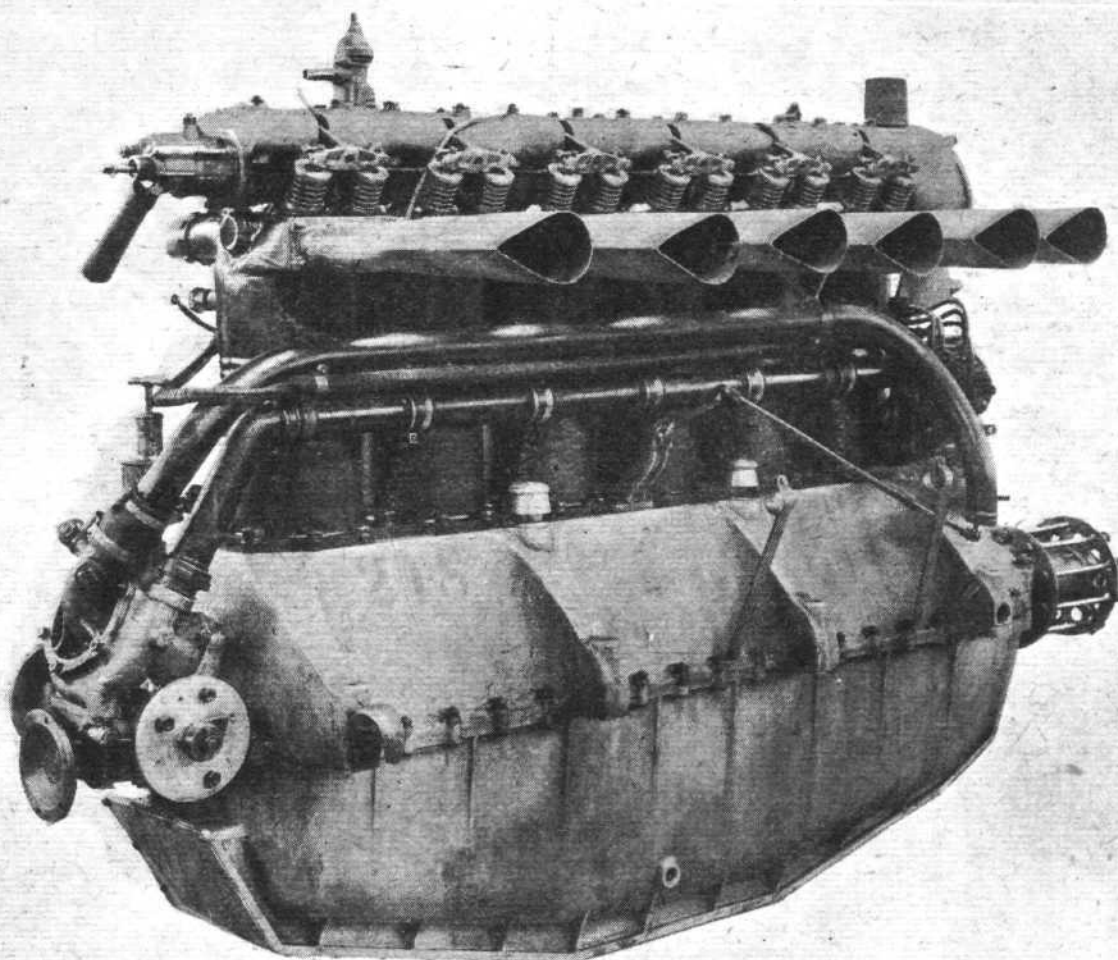
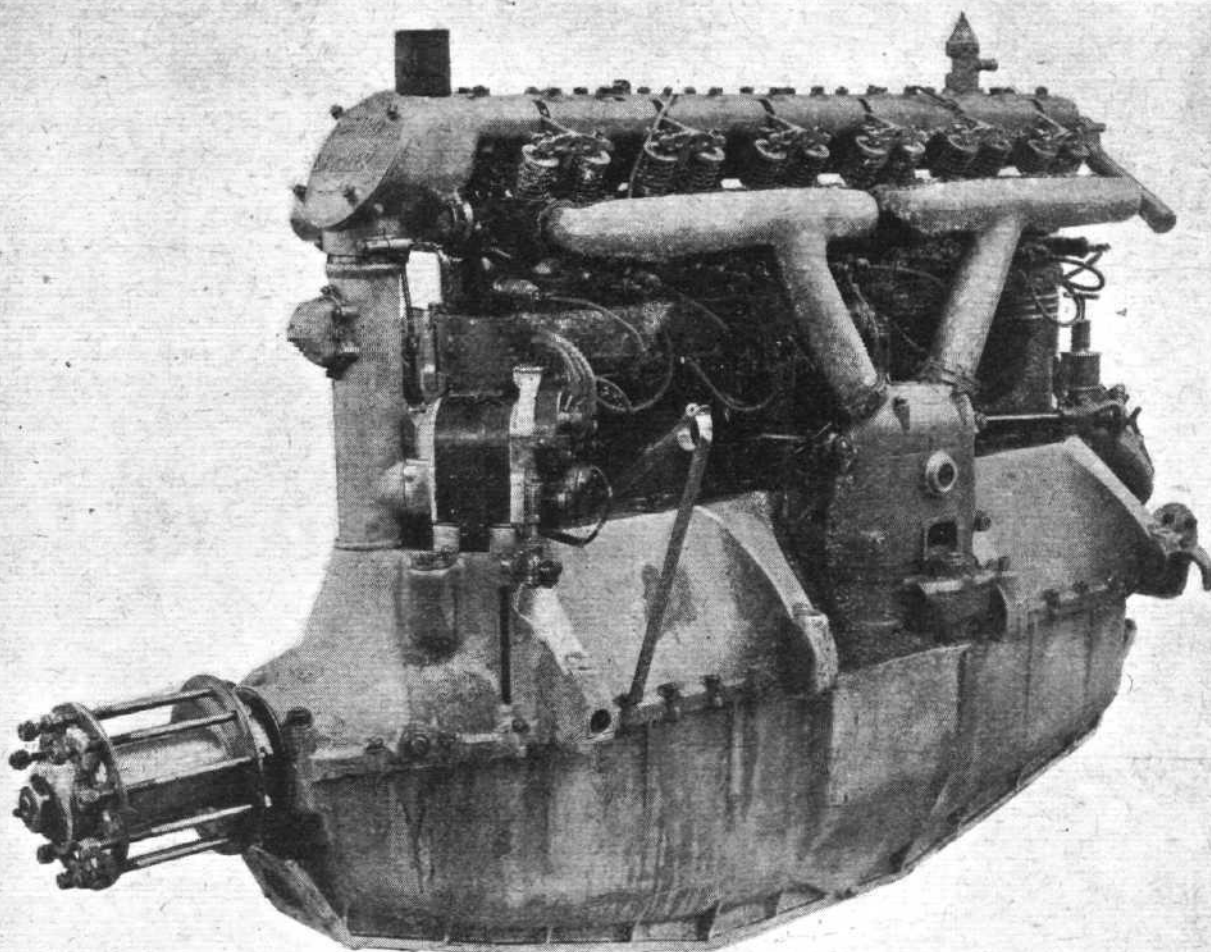


L.F.G. DI

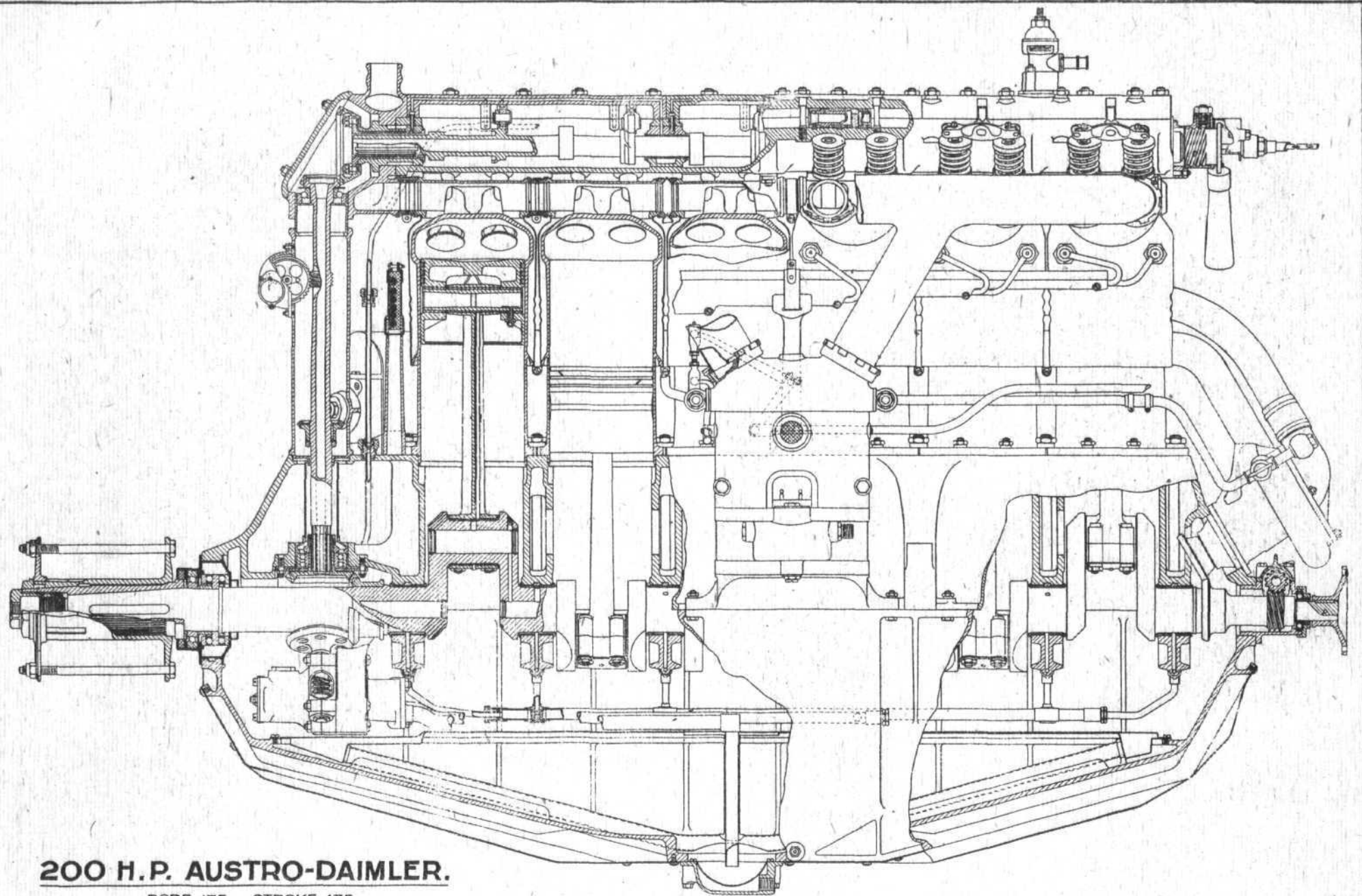
**TWO "ROLAND" PRODUCTS.**—On the left the type CII L.F.G. biplane. This machine, it will be seen, had only one inter-plane strut on each side, which was of the I type so as to take care of the twisting moment due to the travel of the centre of pressure. On the right the Roland single-seater fighter, type D I.



# THE 200 H.P. AUSTRO-DAIMLER AERO ENGINE



Top : Fig. 1.—The 200 h.p. Austro-Daimler engine. Induction side. Bottom : Fig. 2.—Exhaust side of engine.  
(See page 1218 and following pages.)



**200 H.P. AUSTRO-DAIMLER.**

BORE 135. STROKE 175.

General arrangement of the 200 h.p. Austro-Daimler engine, showing lubrication.



# THE 200 H.P. AUSTRO-DAIMLER AERO ENGINE

[Issued by Technical Department, Aircraft Production, Ministry of Munitions.]

## Introductory Note

THE following detailed report on the design, construction, and general performance of the latest type of Austro-Daimler engine is based on an examination and tests carried out at R.A.E. on the engine (No. 19,218) taken from a captured Austrian "Berg" Scout. (R.A.F. No. A.G.6.)

This machine, a single-seater biplane brought down on the Italian front in April, 1918, was captured in very good condition; the engine had apparently only been in use for a few hours.

With the exception of its high stroke, bore ratio and the construction of a detachable inlet valve seating in each cylinder, the design of this engine shows no great resemblance to the earlier types of Austro-Daimler engines; generally speaking, the new 200 h.p. Austro-Daimler possesses more than the usual amount of originality in design found in enemy aero engines.

The general construction of the 200 h.p. Austro-Daimler is shown in the two photographs of the complete engine,

Number of cylinders: six, vertical; Bore: 135 mm.; Stroke: 175 mm.; Normal b.m.e.p.: 123.3 lbs. per sq. in.; Average b.h.p.: 200 at 1,400 r.p.m.; Compression ratio: 5.02:1; Petrol consumption per hour: 111.0 pints; Petrol consumption per b.h.p. hour: 0.555 pint; Oil consumption, per hour: 7 pints; Oil consumption per b.h.p. hour: 0.035 pint; Total weight of engine, dry: 728.5 lbs.; Weight per b.h.p. (normal): 3.64 lbs.

The compression ration is considerably higher than that of any of the enemy engines except the Maybach, and from the complete data published at the end of this report it will be seen that the general efficiency of the engine is good, the h.p. per cu. ft. of stroke volume being 377.3 and the h.p. per sq. ft. of piston area being 216.6.

During calibration and endurance tests carried out at R.A.E. the running of the engine was very good, being very steady between 700 and 1,700 r.p.m. The engine was remarkably clean, having no trace of oil or water leakages during tests.

Compared with the usual high weight standard of enemy engine design, the weight per b.h.p. of 3.64 is quite normal. From our own standard of weights, however, the weight per b.h.p. is disproportionately high. This is chiefly due to the heavy construction of the crank-chamber and oil base, rather than to the design of the cylinders and reciprocating parts, which are well designed and are of light construction compared with other enemy engines.

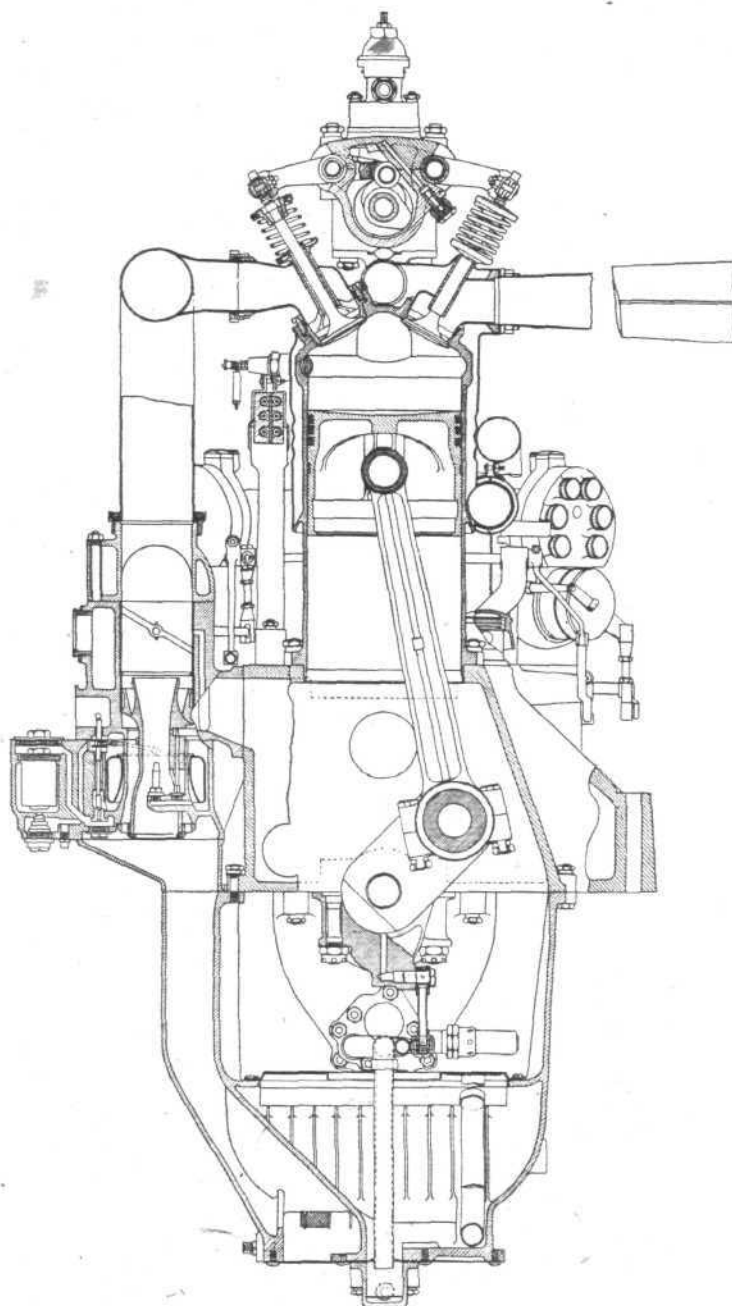


Fig. 3.—Cross-sectional arrangement.

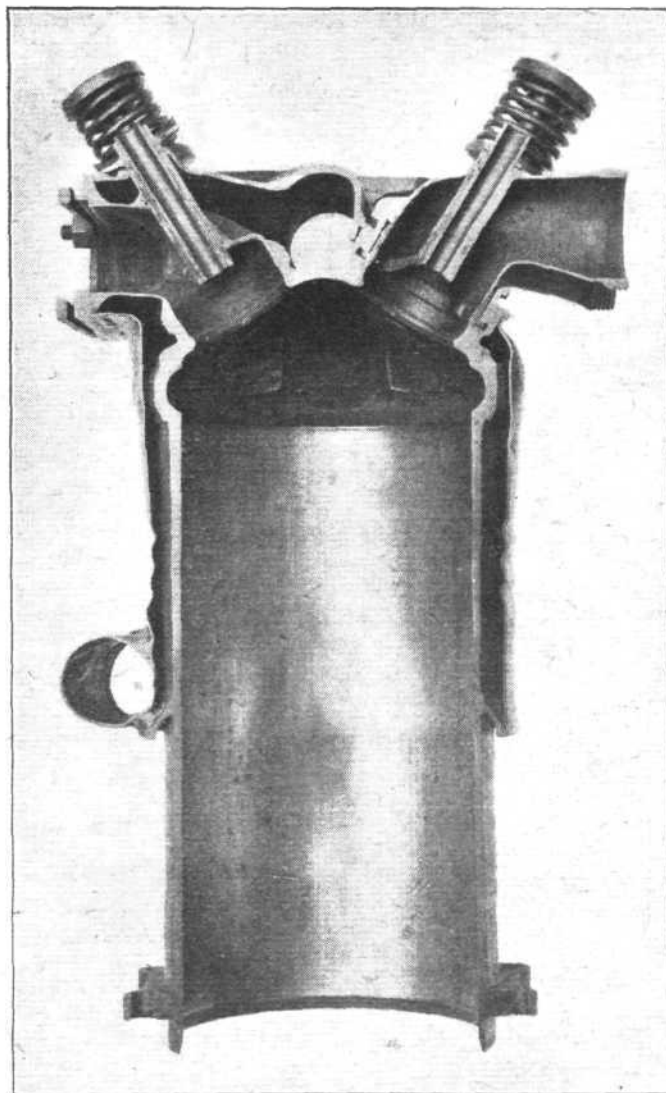


Fig. 4.—Sectional view of cylinder.

Figs. 1 and 2, and also in the accompanying cross sectional and general arrangement drawings.

Following the usual German practice, the engine is of the six-cylinder, vertical, water-cooled type with separate built-up steel cylinders. The principal characteristics of the design and its general performance are given in the following leading particulars of the engine:—

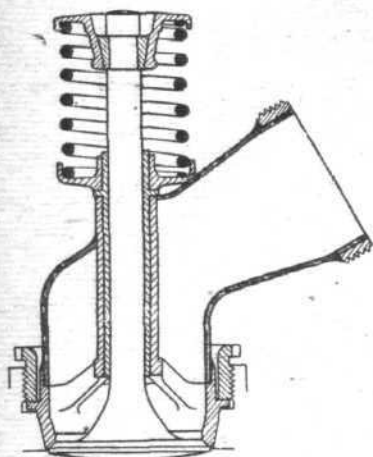
## General Description

As a preliminary survey of the general design of the 200 h.p. Austro-Daimler engine, the principal features of the engine are briefly described in the following summary:—

The six separate cylinders are of the usual built-up steel construction with pressed steel water jackets, and are fitted with twin inlet and exhaust valves in the cylinder heads,

which are integral with the cylinder barrels. The valve pockets are welded into position, with the exception of one inlet valve pocket in each cylinder, which is constructed so as to be easily detachable with its valve seating and guide, as in previous Austro-Daimler engines, so that all the valves can be removed without dismantling the cylinder.

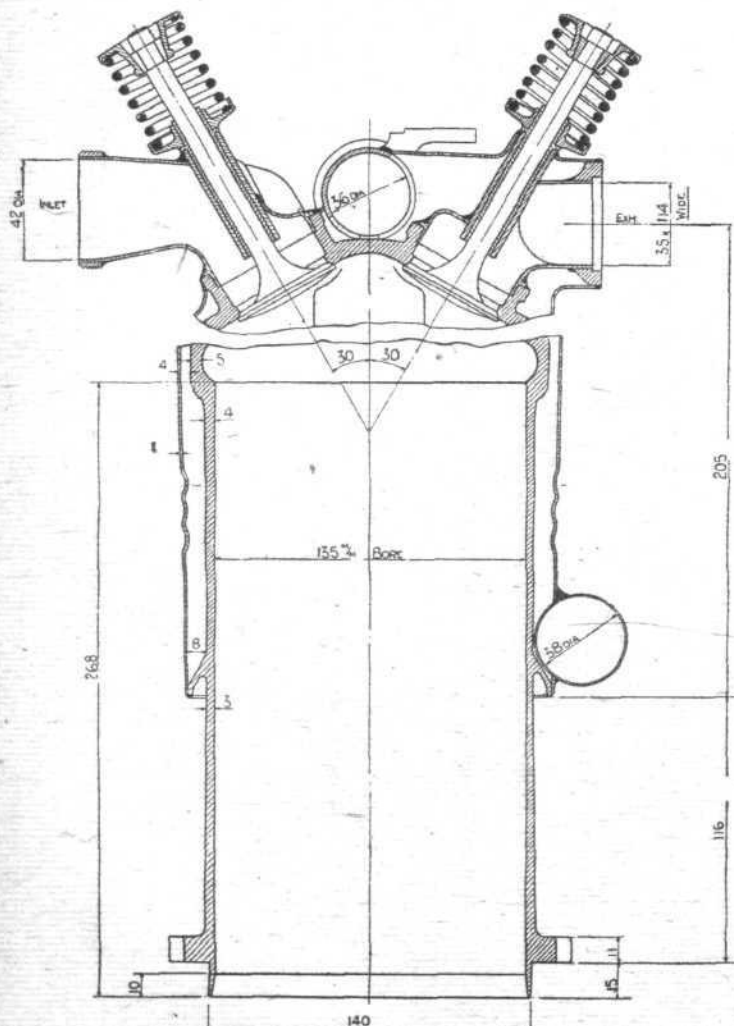
Aluminium pistons are adopted, and, with the exception of those recently fitted to the 230 h.p. Benz engines, were at the time of capture apparently the only aluminium pistons



**Fig. 5.**—Detail of detachable inlet valve pocket. One of these is fitted to each cylinder, and allows the other valves to be withdrawn without disturbing the cylinder.

in use in enemy engines, although since this engine was captured a Rumpler biplane has been brought down fitted with a 270 h.p. Bassé-Selve engine using aluminium pistons. A detailed report of this engine is in course of preparation, and will be published very shortly.

The H section connecting rods are of normal design, and the crankshaft runs in seven white metal bearings, which are



**Fig. 6.—Details of cylinder.**

carried by the top half of the crankcase. The bottom halves of the journal bearing housings are steel forgings, and are very deep in cross section, being similar in design to the journal bearings fitted to the Maybach engines.

The design of the valve gear and camshaft drive presents several interesting details. As shown in the illustrations of the engine, the overhead camshaft is driven by a vertical shaft off the front end of the crankshaft. The camshaft runs in four phosphor-bronze bearings in the centre of an aluminium camshaft case.

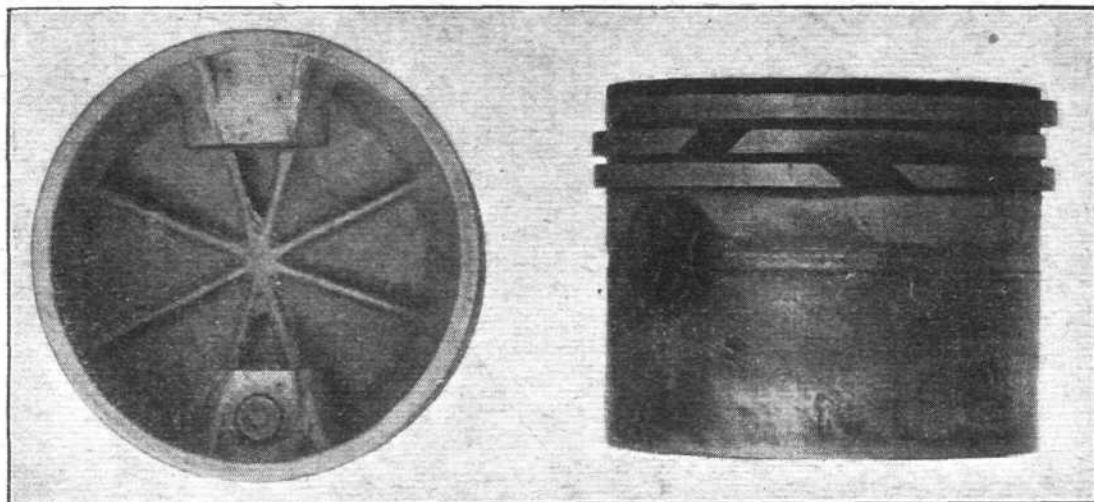


Fig. 7.—Aluminium piston.

A compression release gear, very similar to the Mercedes type, is provided. The water circulation passage from the cylinders to the top of the radiator is taken through the front end of the cast aluminium camshaft casing, just behind the driving bevel gear.

A reciprocating plunger type oil pump is fitted in the front end of the oil base. This pump is driven by bevel and worm gearing directly off the crankshaft and is unusually heavy, but of interesting design.

The lubrication is on normal principles, and embodies a large air-cooled sump at the bottom of the base chamber, which is supplemented by an auxiliary fresh oil reservoir cast in the front end of the top half of the crank chamber. The fresh oil is delivered by a small auxiliary plunger, working in conjunction with the main oil pump, to the front end of the camshaft, the lubrication of which is well carried out.

A "V" type honeycomb radiator is fitted directly behind the propeller, and the centrifugal water pump, which is driven obliquely off the rear end of the crank-shaft, is of ordinary design.

Two Bosch Z.H.6 magnetos are driven diagonally at  $52^\circ$  off the vertical camshaft driving-shaft at the front of the engine, and two plugs are provided in each cylinder. The magneto controls are interconnected with the throttle control, so that ignition is automatically retarded when throttling down.

A heavy duplex carburettor feeds the cylinders through two separate steel induction manifolds, which are galvanised, and lagged with asbestos; each manifold feeds three cylinders.

The carburettors are water jacketed and heated by the cylinder water circulation system in the usual way.

Main and slow running jets are fitted, the two annular floats being housed in chambers surrounding the choke tubes. The main air intake is taken through a passage cast in the two halves of the crankcase, leading to the chamber below the false bottom of the oil sump.

An air pump of the spring plunger type is driven off the camshaft and is mounted on the top of the camshaft casing towards the rear end of the engine. A transverse shaft driven off the rear end of the crankshaft carries two cams for the synchronised gun interrupter gear.

No exhaust manifold is provided, each cylinder being fitted with a short streamline section exhaust pipe about 12 ins. long, as shown in the illustrations of the engine.

### Details of Construction

### Cylinders

The six separate cylinders are made entirely of steel. The cylinder barrels, which are integral with the heads, are built up of steel forgings. The barrels are machined all over, and are ground to 135 mm. bore; the thickness of the cylinder walls tapers on the outside from 3.0 mm. at the centre to 4.0 mm. at the top, and 4.0 mm. at the base.



The water jackets are pressed in the usual way from sheet steel 1.0 mm. thick, and are very short. The bottom of each water jacket is flanged over and welded to a bevelled flange, which is machined on the cylinder barrel, as shown in the sectional photograph of the cylinder, Fig. 4; three annular corrugations are formed in the water jackets to allow for expansion.

Two inlet and two exhaust valves are fitted in each cylinder head, and work at an angle of  $30^\circ$  to the vertical axis of the cylinders. These are clearly shown in the cross sectional drawing of the engine, Fig. 3, and in the detail drawing, Fig. 6.

In each cylinder two of the exhaust pockets and one of the two inlet pockets are pressed and welded into the head. The other inlet valve, with its seating and guide, is carried in a separate detachable pocket, fixed in position by a large gun-metal union nut, as in previous Austro-Daimler and Beardmore engines. This allows the other valves to be with-

tion of the stress than in the design of the new 230 h.p. Benz aluminium pistons. Steel bushes are cast into the gudgeon pin bosses in the pistons, and the gudgeon pin is fixed only by a large split pin, which passes through a hole drilled in the boss; these holes are also fitted with steel bushes.

Three plain cast iron rings are fitted above the gudgeon pins, and an annular groove is machined around each piston on the gudgeon pin level for lubrication.

The weight of each piston is 3.52 lbs. with rings, and the weight of each gudgeon pin is .66 lb.

#### Connecting Rods

The connecting rods are of H section and exceptionally long for the size of the engine; from the German standard of weight they are of comparatively light section, but the central webs of the rods are not drilled. Four bolts are used to hold the halves of the big-end bearings. These bolts are 10 mm. diameter, and each pair is locked by a sheet steel clip.

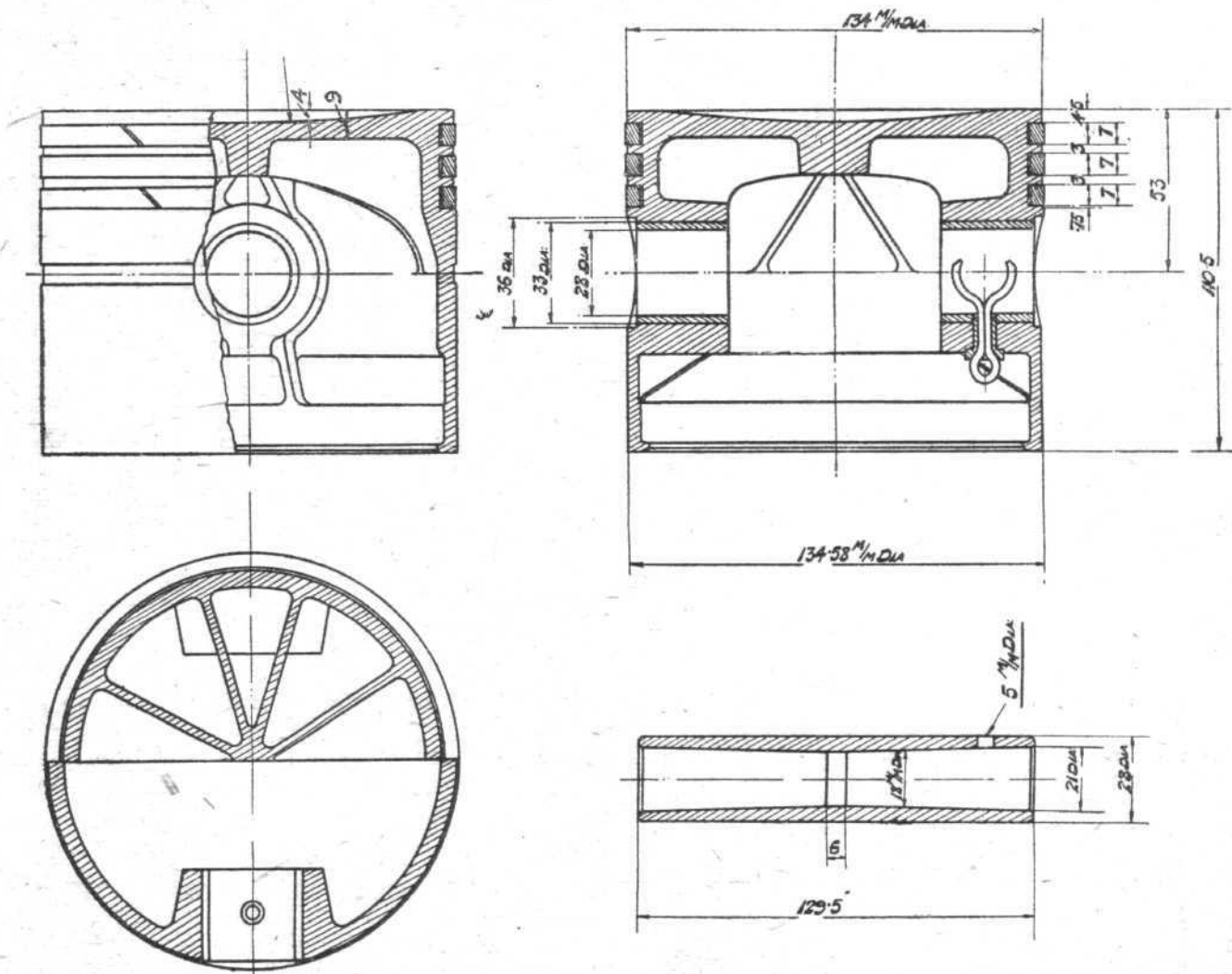


Fig. 8.—Details of piston and gudgeon pin.

drawn from the cylinder through the opening left on the removal of the pocket, without disturbing the cylinder.

The flanges at the base of the cylinders are 11.0 mm. thick, and the cylinder spigots extend 15 mm. into the crankcase. Lugs are machined in the base flange of each cylinder to take the eight studs which bolt each cylinder to the crankcase. Four of the studs are of larger diameter, i.e., 19.0 mm., and pass through the crankcase top-half; they act as main holding-down bolts and secure the lower portion of the journal bearings, thus relieving the crankcase of most of the working stress.

The total weight of each cylinder, bare, is 18.4 lbs.

#### Pistons

These are of cast aluminium; the crowns are very slightly concave, and are supported by eight radiating ribs, as shown in detail in the sectional drawing and photographs, Figs. 7 and 8. It will be noticed that these ribs are not spaced equidistantly, the two ribs over each of the gudgeon pin bosses being closer together, and extending downwards so as to support each boss from below.

This design undoubtedly provides a much better distribu-

The white metal lining of the bronze big-end bearing shells is 1 mm. thick, and the small ends are fitted with phosphor-bronze bushes for the gudgeon pin bearings, which are lubricated by small diameter pipes attached to the central web of the rods in the usual way. Two horizontal oil grooves are cut in the lower halves of the big-end white metal bearings, and a short transverse oil groove in the top halves, whilst the small-end bushes are provided with three longitudinal oil grooves.

Weight of complete con. rod, 4.84 lbs.; weight of big end, 3.18 lbs.; weight of small end, 1.66 lbs.; length of con. rod between centres, 315 mm.

#### Valves and Valve Gear

The twin inlet and exhaust valves are all of the same dimensions and are interchangeable, and, as previously mentioned, work at  $30^\circ$  to the vertical cylinder axis.

The largest diameter of the valve heads is 48 mm., and the effective diameter is 44 mm., which gives a combined inlet valve opening area of 4.24 sq. ins. The mean gas velocity through the inlet valves is 140 ft. per second.

The general design of the complete valve gear is clearly

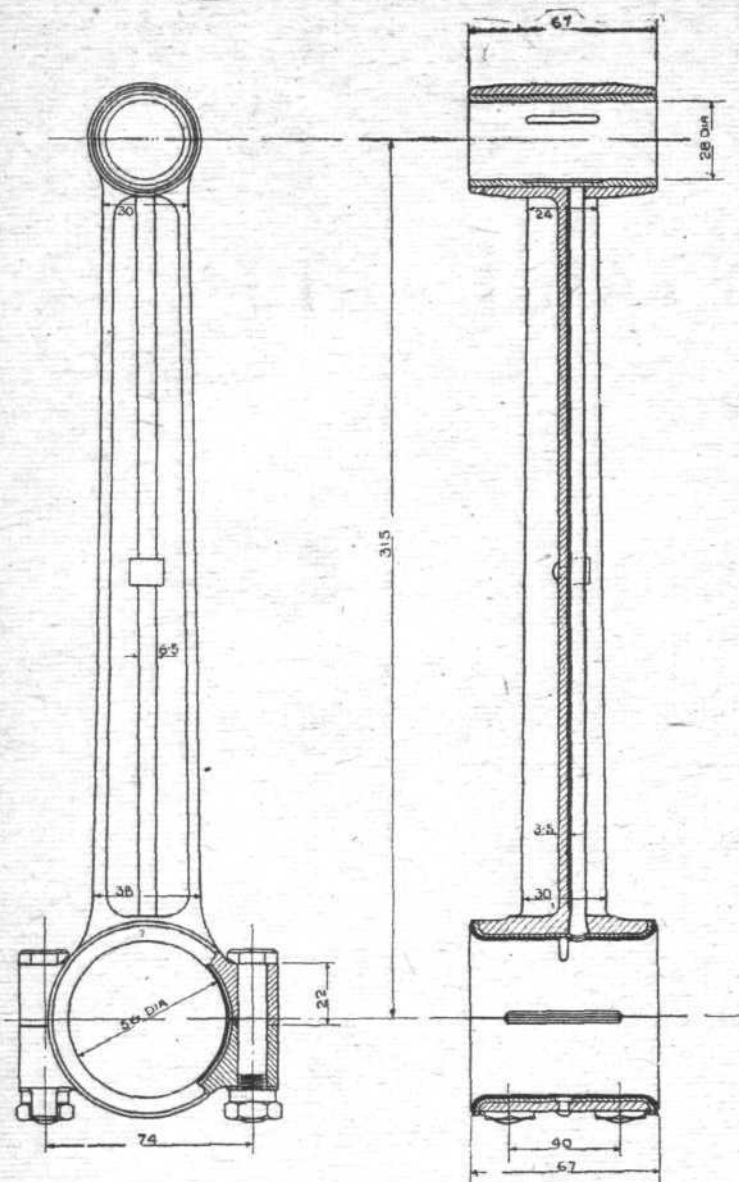
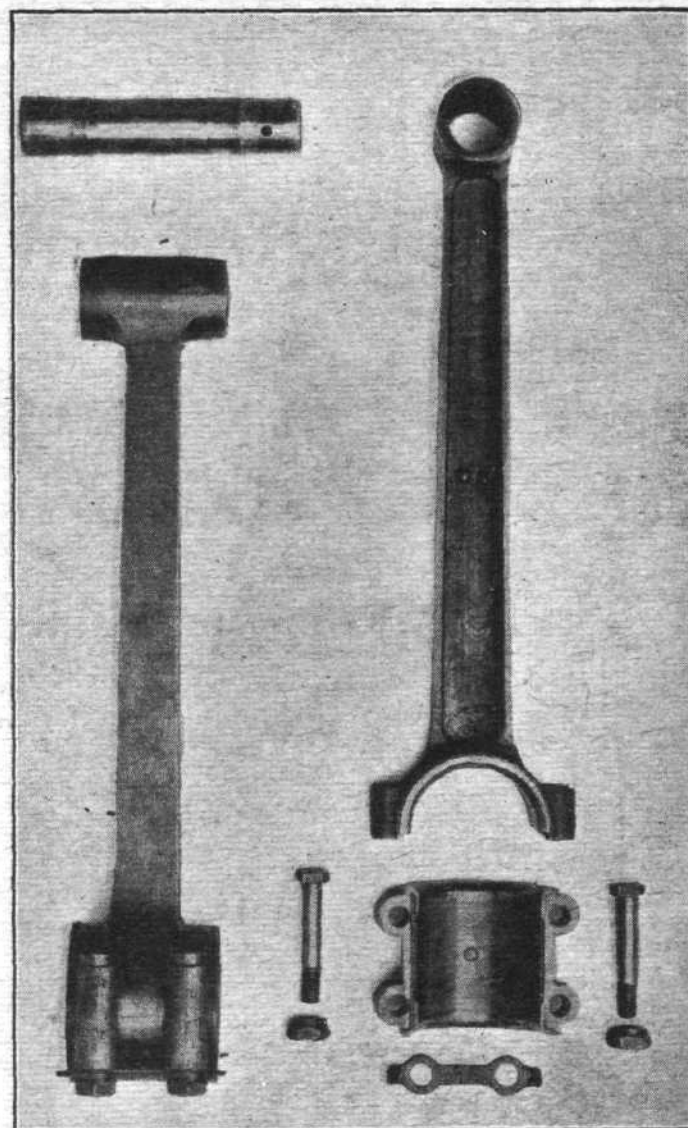


Fig. 9.—Details of connecting rod.



Photograph of connecting rod and gudgeon pin.

shown in the general arrangement drawings, and in Fig. 3, and details of the valves and springs are given in Fig. 11.

Single helical valve springs are fitted to each valve, and the valve spring collars are held in position by split cones,

which register with the recess cut in the end of the valve stem, as shown in Fig. 11. This spring locking device is similar to that used in the Benz engines.

(To be continued.)



**AN INTERESTING ENEMY BOMBER.**—The Albatros type G. biplane. This machine, it will be noticed, has only one pair of inter-plane struts outside the engine on each side. The formation of these struts is unusual, diagonal struts having, apparently, taken the place of incidence wires. The upper plane appears to be of a very deep section, as in the latest Fokker machines, and it would seem probable that this feature accounts for the small number of inter-plane struts.



# THE ROYAL AERO CLUB OF THE U.K.

## OFFICIAL NOTICES TO MEMBERS.

### THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916)

Administered by the Royal Aero Club

For the benefit of *Officers, Non-Commissioned Officers and Men* of the ROYAL AIR FORCE who are incapacitated on Active Service, and for the Widows and Dependants of those who are killed.

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**Flying Services Fund Committee.**—A meeting of the Flying Services Fund Committee was held on Thursday last, the 24th inst., when there were present:—Lieut.-Col. T. O'B. Hubbard, R.A.F., in the Chair, Mr. Chester Fox, Lieut.-Col. H. G. Gold, R.A.F., Col. R. H. More, C.M.G., and Lieut.-Com. H. E. Perrin, R.N.V.R., Secretary.

**Grants and Allowances.**—The following Grants and Allowances were made:—

65. An allowance of £3 a month for six months to the widow of a 1st Class Air-Mechanic in the Royal Air Force who had been killed on active service.

96. An allowance of £5 a month for three months to the mother of a 2nd Lieutenant in the Royal Flying Corps who had been accidentally killed on active service.

97. An allowance of £2 a month for six months to the widow of a 3rd Class Air-Mechanic in the Royal Air Force who had been accidentally killed on active service.

98. An allowance of £2 a month for six months to the

mother of a 2nd Class Air-Mechanic in the Royal Air Force who had been killed on active service.

100. An allowance of £3 a month for six months to the widow of a 3rd Class Air-Mechanic in the Royal Air Force who had died on active service.

101. A grant of £10 to the widow of a Sergeant in the Royal Air Force who had been killed on active service.

108. An allowance of £2 a month for six months to the widow of a 2nd Class Air-Mechanic in the Royal Flying Corps who had been killed on active service.

111. An allowance of £1 10s. a month for six months to the widow of a private in the Royal Flying Corps who had been killed on active service.

112. An allowance of £2 a month for six months to the widow of a 1st Class Air-Mechanic in the Royal Air Force who had been killed on active service.

99. An allowance of £2 a month for six months to the mother of a Sergeant in the Royal Air Force who had died on active service.

103. An allowance of £1 10s. a month for six months to the widow of a 2nd Class Air-Mechanic in the Royal Flying Corps who had been killed on active service.

105. An allowance of £2 a month for six months to the mother of a Cadet in the Royal Air Force who had been killed on active service.

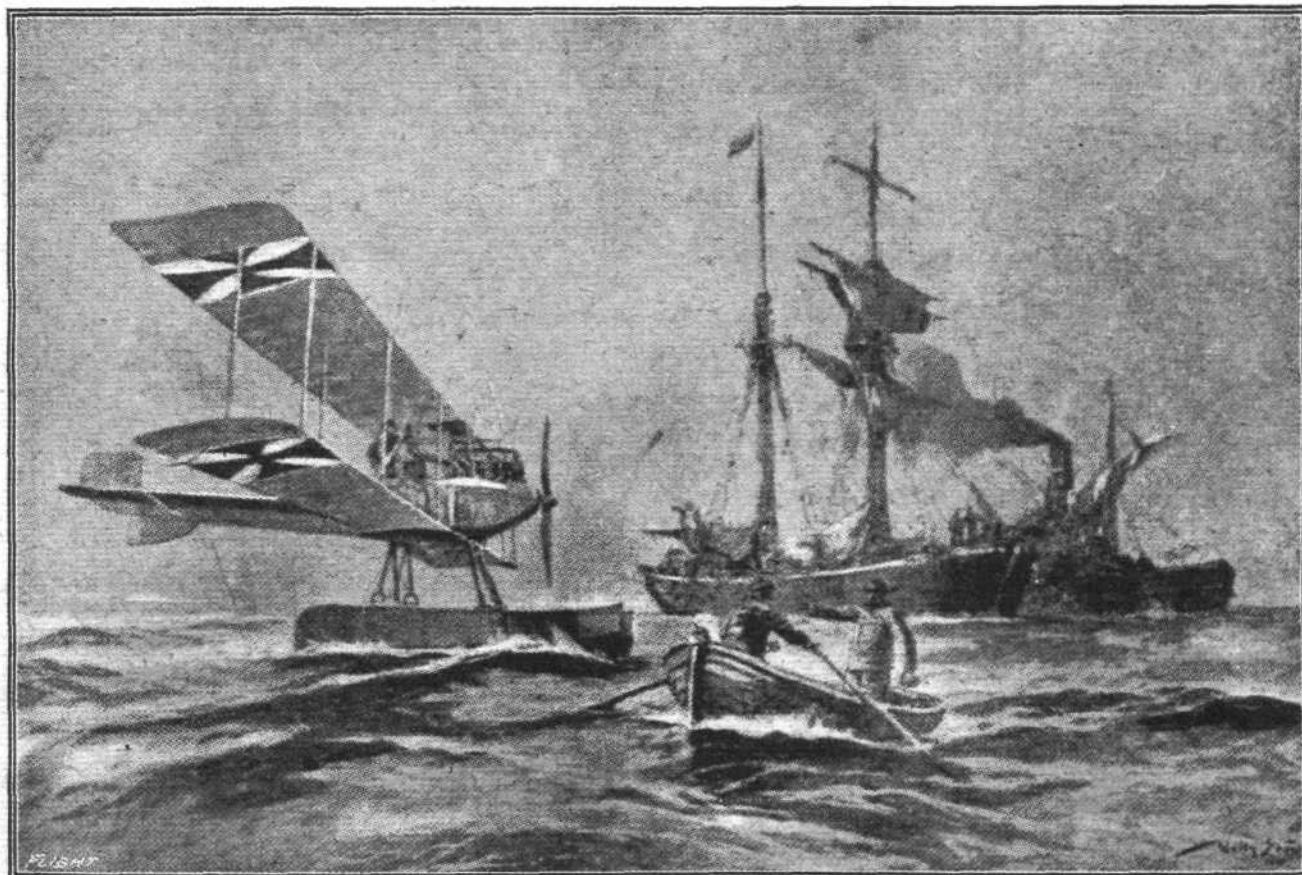
107. An allowance of £1 a month for six months to the father of a 3rd Class Air-Mechanic in the Royal Flying Corps who had been killed on active service.

#### Subscriptions

	£	s.	d.
Total subscriptions received to Oct. 22nd, 1918	13,661	19	2
Staff and Workers of Gwynnes, Ltd. (Seventy-third contribution)	..	8	19
Anonymous	..	0	10

Total, October 29th, 1918 .. .. 13,671 8 9

Offices: THE ROYAL AERO CLUB,  
3, CLIFFORD STREET, LONDON, W. 1.  
H. E. PERRIN, Secretary.



(Tohli, Mexico.)

A picture of a German seaplane which has captured a Russian sailing vessel in the Baltic.—From a German Information Agency

# THE ROLL OF HONOUR

(When an Officer is seconded from the Army, his unit is shown in brackets)

Published October 23rd

**Killed**  
Allanson, Lieut. W. G.  
Anderson, Sec. Lieut. W.  
Hopgood, Lieut. E. W. F. (Queb.)  
Dunbar, Sec. Lieut. J. C.  
Hill, Lieut. R. F.  
Avery, Sec. Lieut. D. J.  
Bairdow, Sec. Lieut. A.  
Britton, Lieut. R. E.  
Griffiths, Sec. Lieut. A. H.

**Accidentally Killed**  
Cruise, Sec. Lieut. M. G.  
Troth, Sec. Lieut. G. N.  
Wicks, Sec. Lieut. G. V. (Aus. F.C.)  
Pullar, Sec. Lieut. J.

**Died of Wounds**  
Died  
Wounded  
Kerr, Sec. Lieut. H. N. (Aus. F.C.)  
Patterson, Sec. Lieut. E. M.  
Roberts, Sec. Lieut. G.  
Sutcliffe, Sec. Lieut. T. C.

**Previously Missing, now reported Wounded and Prisoner**  
Handley, Sec. Lieut. J.

**Previously Missing, believed Wounded and Prisoner, now reported Wounded and Prisoner**  
Tysoe, Lieut. C. G.

**Missing**  
Carpenter, Lieut. E.  
Cowan, Lieut. J.  
Hall, Lieut. R.  
Hill, Sec. Lieut. S. J.  
Birkhead, Lieut. J. B.  
Brown, Lieut. H. M.  
Connolly, Lieut. S. D.  
Forsyth, Lieut. A. F.

**Previously Missing, now reported Prisoners**  
Goffe, Sec. Lieut. W.  
Hill, Sec. Lieut. S. J.  
Mallett, Lieut. H. P.  
Marsden, Sec. Lieut. C.

Published October 24th

**Killed**  
Bailey, Sec. Lieut. G. W.  
Clarke, Sec. Lieut. J.  
Cram, Sec. Lieut. J. M.

Sonnenberg, Lieut. M. C.

**Died of Wounds**  
Wounded  
Brown, Lieut. L. H.  
Clayton, Sec. Lieut. J. G.  
Gribben, Capt. E.  
Hinde, Sec. Lieut. P.  
Hogg, Sec. Lieut. A.

**Missing**  
Awde, Lieut. I. W.  
Beck, Lieut. T., M.C.  
Bucknall, Sec. Lieut. C. V. A.  
Bond, Lieut. F. E.  
Davison, Lieut. C. W.

**Prisoner of War**

Riley, Sec. Lieut. E. I.

**Previously Missing, now reported Prisoners**  
Anderson, Lieut. J. D.  
Beauchamp, Lieut. F. E.  
Blake, Sec. Lieut. A. G. S.  
Bullen, Lieut. E. H.  
Clark, Lieut. C. G.

**Previously Missing, now reported Missing, believed Prisoners**  
Lewis, Lieut. W. T. S.  
Luard, Sec. Lieut. R. B.

Published October 25th

**Killed**  
Henry, Sec. Lieut. J. A. G.  
Jenkins, Sec. Lieut. A. E.  
Kemp, Sec. Lieut. R. H.

**Previously Missing, now reported Killed**  
Montgomery, Lieut. J. R.

**Accidentally Killed**  
Nicol, Lieut. H. (Aus. F.C.)

**Wounded**  
Cope, Sec. Lieut. C. S.  
Dalglish, Sec. Lieut. N. J.  
Gidewell, Sec. Lieut. C. N.  
Irving, Sec. Lieut. J. L.

**Previously Missing, now reported Wounded and Prisoner**  
Pollard, Lieut. W. H.

**Missing**  
Cairns, Sec. Lieut. W. T. J.  
Calrow, Lieut. R.  
Freer, Sec. Lieut. W.  
Hancock, Sec. Lieut. C.  
Jones, Sec. Lieut. L. S. R.

**Previously Missing, now reported Missing, believed Prisoners**  
Crookell, Sec. Lieut. S. E.  
Dunlop, Sec. Lieut. J. M.  
Ingram, Capt. R. S. S.  
Latimer, Capt. D., M.C.

Judkins, Sec. Lieut. O. V.  
Neil, Sec. Lieut. J. W.  
Perring, Sec. Lieut. J. H.  
Prime, Sec. Lieut. H. L.  
Warner, Lieut. J. W.

**Previously Missing, believed Prisoners**  
Loudoun, Capt. L. G.  
Porter, Sec. Lieut. A. C.  
Stephens, Sec. Lieut. C. H.  
Venter, Capt. C. J.

**Previously Missing, now reported Prisoners**  
Ritchie, Sec. Lieut. T. M.  
Tison, Sec. Lieut. M.

Published October 26th

**Killed**  
Brown, Sec. Lieut. C. V. R.  
Chadwick, Sec. Lieut. F. W.  
Daunt, Sec. Lieut. C. O'N.

**Died of Wounds**  
Fletcher, Sec. Lieut. C.  
Gardner, Capt. C. V.

**Wounded**  
Anderson, Sec. Lieut. A. M.  
Beauchamp-Proctor, Capt. A. W.,  
D.S.O., D.F.C., M.C.  
Browne, Capt. R. F.  
Haviland, Sec. Lieut. W.  
Hey, Sec. Lieut. M. W. R.

**Previously Missing, now reported Wounded and Prisoner**  
Struben, Lieut. H. M.

**Missing**  
Ely, Lieut. F. W.  
Lackey, Sec. Lieut. H. D.

**Previously Missing, now reported Prisoners**  
Coulson, Sec. Lieut. W. E.  
Henderson, Sec. Lieut. W. R.  
Kewley, Lieut. B. H. (Manit.).

**Previously Missing, now reported Missing, believed Prisoners**  
Benjamin, Lieut. A. L.  
Carpenter, Lieut. F.

Published October 28th

**Killed**  
Butterworth, Lieut. F. A. (Aus. F.C.)  
Fenton, Lieut. J. A.

**Died of Wounds**  
Kelly, Sec. Lieut. T. W.

**Wounded**  
Anderson, Sec. Lieut. J.  
Atkins, Sec. Lieut. F. I.  
Boon, Sec. Lieut. W. J.

**Missing**  
Bodley, Sec. Lieut. W. G. L.  
Brandrick, Sec. Lieut. A.  
Bryant, Lieut. J. H. R.  
Cornish, Capt. E. W., M.C. (Aus. F.C.)  
Courtenay, Sec. Lieut. W. J.  
Davies, Sec. Lieut. D. P.  
Eyre, Sec. Lieut. H. C.

**Previously Missing, now reported Prisoners in German hands**  
Gross, Lieut. C. R. (Manit.).

**Previously Missing, now reported Prisoners**  
Carveth, Lieut. W. A.  
Conlan, Sec. Lieut. T.  
Coombes, Sec. Lieut. E. S.  
Harrison, Lieut. A. H.

**Previously Missing, now reported Missing, believed Prisoners**  
Preston, Sec. Lieut. A.

Published October 29th

**Killed**  
Aizlewood, Major L. P.  
Lamburn, Lieut. G. A.  
Stata, Lieut. B. A.

**Died of Wounds**  
Lucas, Lieut. H. W. H.

**Missing, believed Drowned**  
Waterson, Sec. Lieut. J. M.

**Wounded**  
Bain, Sec. Lieut. N. H.  
Ballantyne, Sec. Lieut. G. A.  
Collyns, Sec. Lieut. C. H. A.  
Dinwoodie, Capt. H., M.C.  
Graham, Sec. Lieut. J.  
Green, Sec. Lieut. W. C.

**Missing**  
Bardgett, Lieut. W. E.  
Cornwell, Sec. Lieut. F.  
Houlgrave, Sec. Lieut. C.  
Poe, Sec. Lieut. J. M.

**Previously Missing, now reported Prisoners**  
Ashton, Sec. Lieut. K. H.  
Bayliss, Lieut. W. M. F.  
Bosher, Lieut. H.  
Crickmore, Lieut. E. B.  
Laurie, Sec. Lieut. K. S.

**Previously Missing, now reported Prisoners**  
Lloyd, Sec. Lieut. S. T. R.  
MacAndrew, Lieut. J. O.  
O'Callaghan, Lieut. M. A.  
Trubshawe, Sec. Lieut. W. V.  
Wilby, Sec. Lieut. E. E.

## 140 American Machines in a Raid

AIR activity all along the American front has been described as "intensive" recently. October 18th was a busy day: 17 enemy machines were shot down and 140 American machines (60 bombers and 80 scouts) took part in a raid on German back areas. The German air service, it has been noticed, is making increasing use of parachutes on this sector.

## New German Aerodromes in Belgium

ONE significant thing in connection with the German retreat is that the enemy is siting his new aerodromes well back, the bulk of those identified by aerial reconnaissance being in the area between Mons and Maubeuge. As they are much farther back than is necessary for the present operations it would appear that they have been selected with an eye to the probability of a farther retirement.



# THE AUSTRIAN BERG SINGLE-SEATER

200 H.P. AUSTRO-DAIMLER ENGINE

(Continued from page 1198.)

REFERENCE was made in our last issue to the front bulkheads of the body, which serve the double purpose of body struts and cradles for the engine bearers. In Fig. 1 were shown half-sections of the five front bulkheads showing their general shape and proportions. Fig. 3 shows the general arrangement of the engine bearers and the cradles supporting them. The two engine bearers are built up of three laminations each, all of spruce. As the cradles are not so arranged as to form a series of triangles when seen in side elevation, as is not infrequently done on German machines, the diagonal bracing formed by the 3-ply covering has been reinforced, in the Berg, by two steel tubes on each side. These will be seen in Fig. 3. The front one runs from the point where the engine bearer rests on the front bulkhead to the 3-ply side where this joins former No. 2, the tube being horizontal in side view but sloping out in plan. This

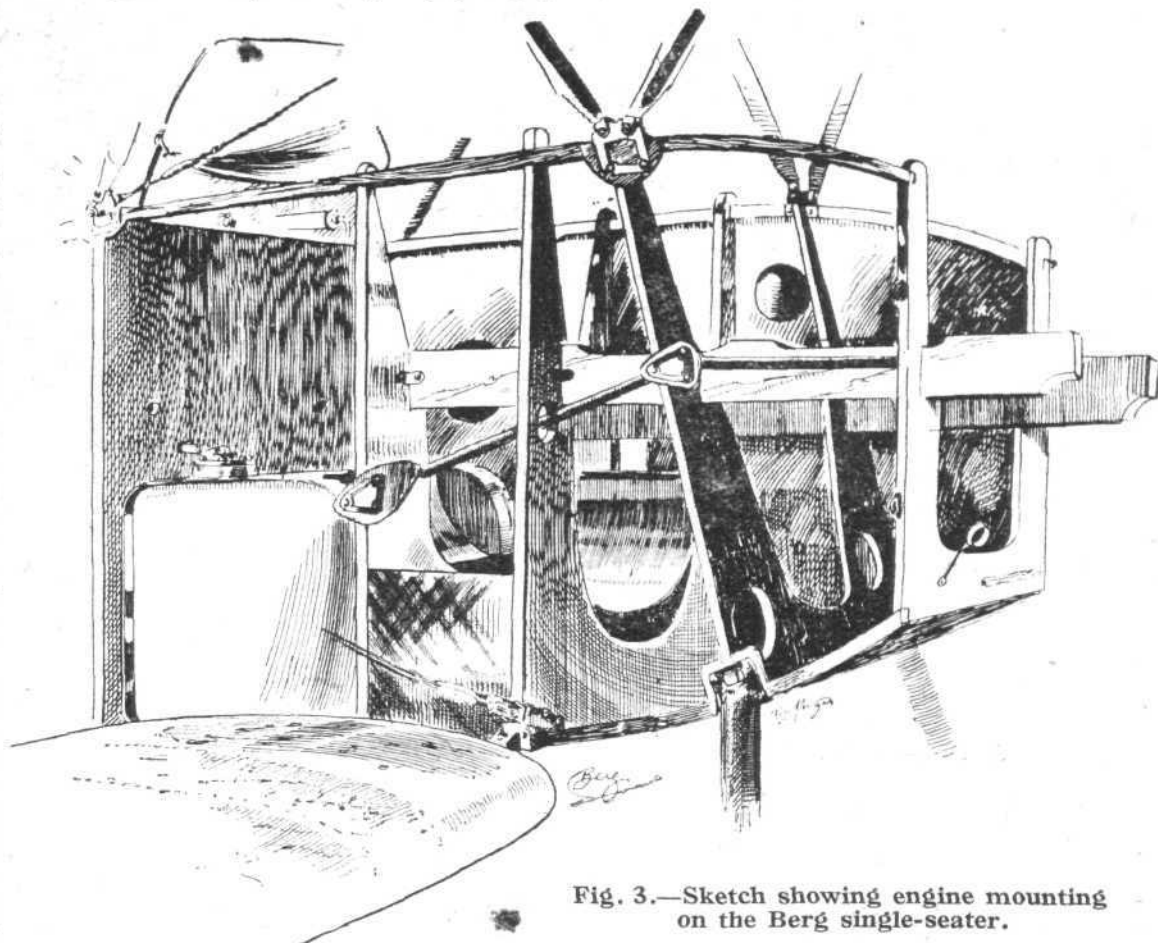


Fig. 3.—Sketch showing engine mounting on the Berg single-seater.

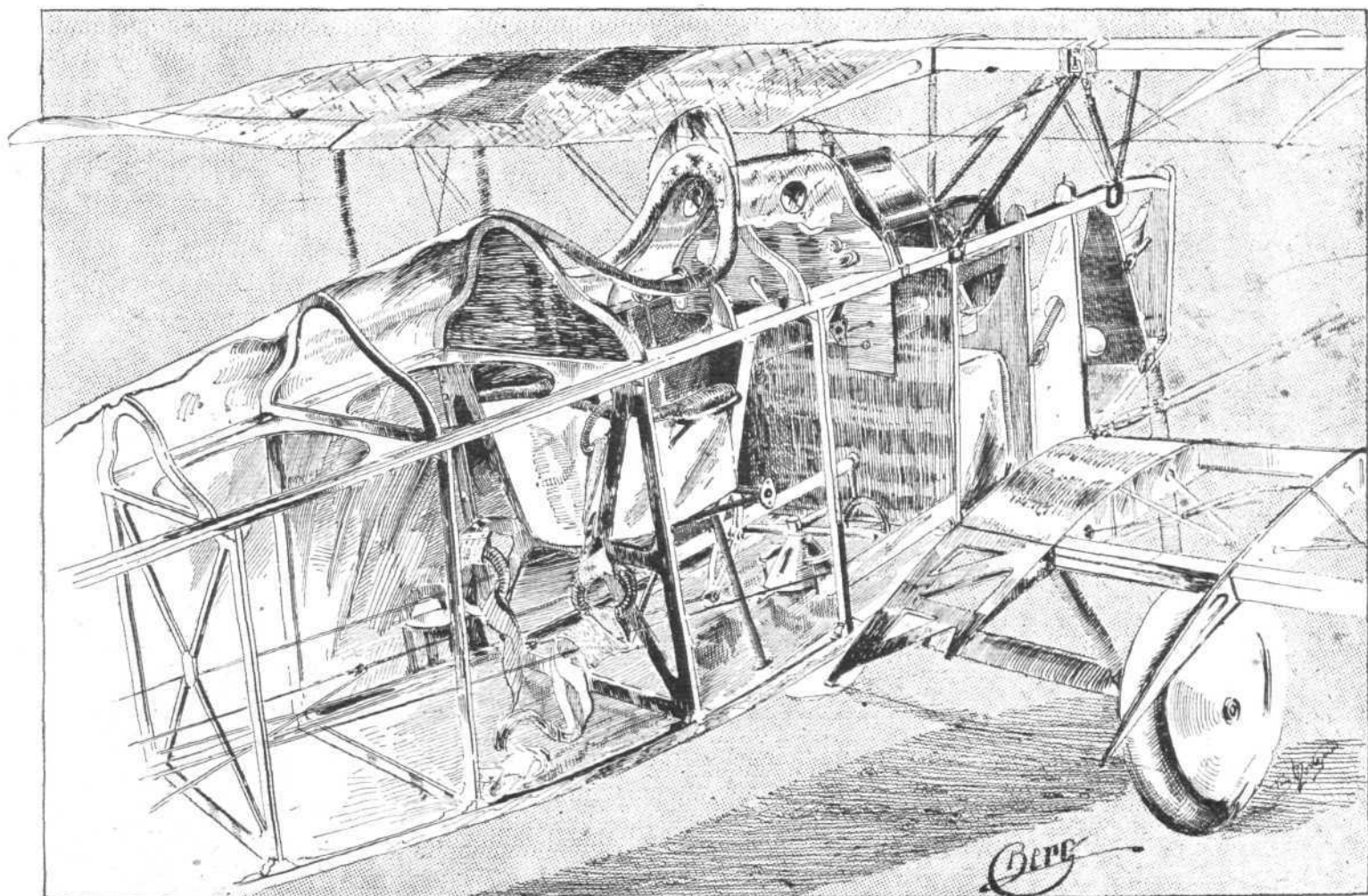


Fig. 4.—Three-quarter rear view of the front portion of the Berg. The covering has been removed to show the internal construction. In the top plane it would appear at first glance that only one spar is fitted. This is not, of course, the case, but is caused by the fact that the front spar is very close to the leading edge, and is therefore, in this particular view, covered by the rear spar.

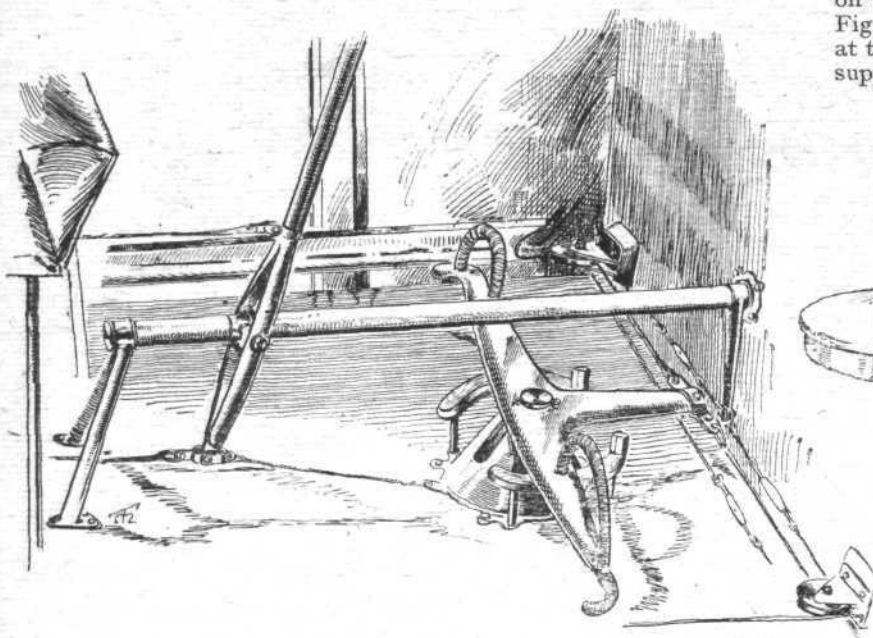
was also indicated in Fig. 1 published last week. The second tube, bolted at its front end to the second former, runs through an opening in the third and to the outer edge of the fourth former.

### Engine.

The engine with which the Berg was fitted is a 200 h.p. Austro-Daimler [particulars of which are published elsewhere

that the set of instruments fitted contained any of unusual interest. The sides of the turtle-back are fitted at this point with circular windows in order to provide better lighting of the instrument board.

The pilot's cockpit is of fairly roomy proportions, and the seat itself is of the "bucket" type, fitted with comfortable arm rests, which would appear to be a considerable advantage on a long flight. The seat is mounted, as indicated in Fig. 4, partly on the built-up transverse framework at this point and partly on a tubular structure which supports the front of the seat. A safety belt is pro-



[Fig. 5.—Sketch of the controls of the Berg.

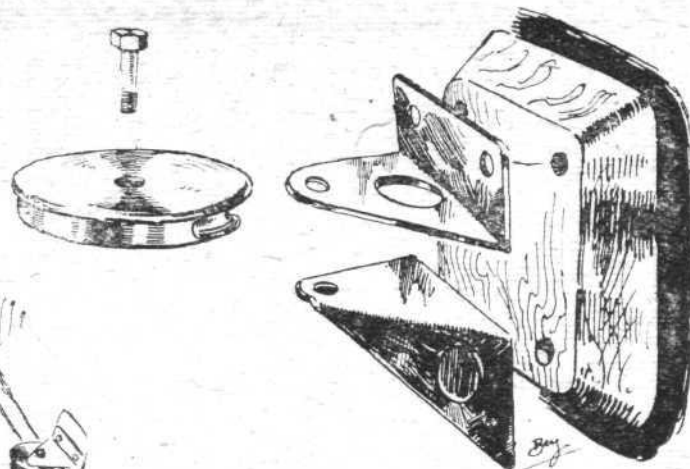


Fig. 6.—Analytical sketch of one of the pulleys over which the rudder cables travel.

in this issue, Ed.), but as it was not in place on the machine when our representatives examined it we have not been able to obtain any details.

### Tanks.

The main petrol tank is placed in the bottom of the fuselage, and has, according to a stamp on it, a capacity of 82 litres (about 18 gallons). A small service tank is mounted inside the top cowling of the body, supported on four small steel tubes from the top longerons. This tank has a capacity of 16 litres (about 3.5 gallons). As the various connections are not intact on the machine it has been difficult to follow in detail the petrol feed system, but it appears probable that the main petrol tank is under pressure, the fuel being forced from it up into the small servi

vided, the springs of which are in the form of rings made up of two sets of coil springs, one inside the other.

### Controls.

The controls of the Berg are shown in Fig. 5. The control lever itself is somewhat incomplete on the machine, the handle in which it terminates at the top being absent so that it has not been possible to ascertain the shape of the grip, otherwise the controls are intact. The control column, it will be seen, is a steel tube, forked at its lower end, the arms of the fork

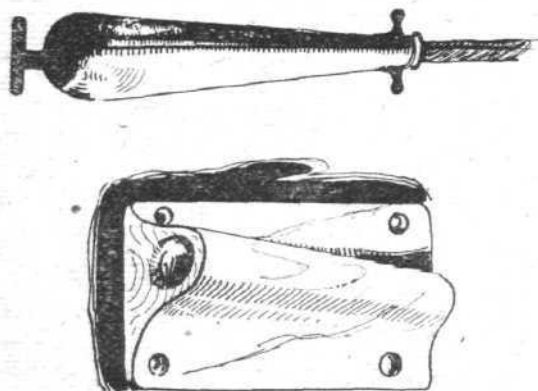


Fig. 7.—The control cables on the Berg are carried, where passing through the sides of the body, in guides. The top sketch shows the metal guide on the outside of the body, while the lower drawing illustrates the wood guide employed on the inside of the three-ply body covering.

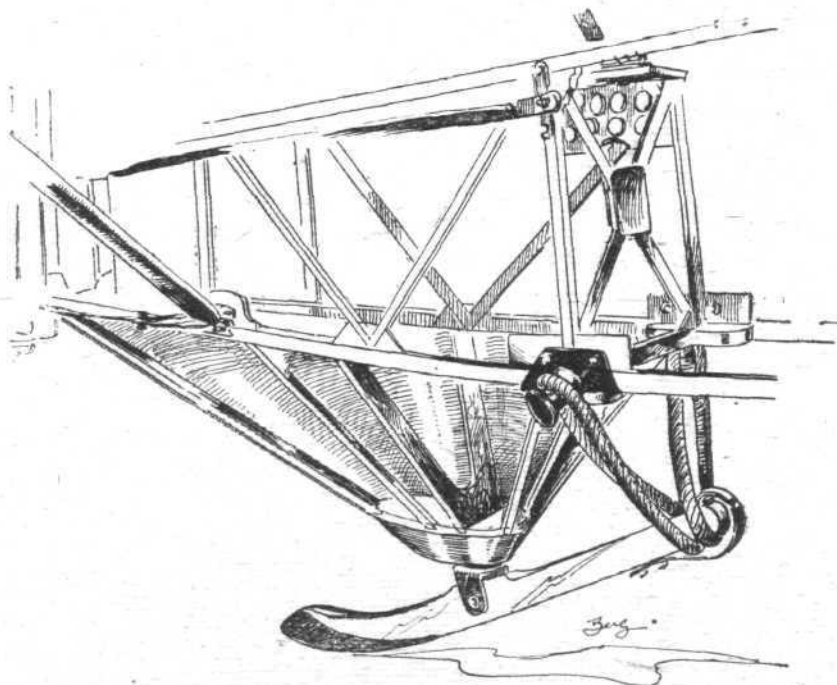


Fig. 8.—The tail skid of the Berg is mounted, as shown in this sketch, on a structure of wood strips, covered with three-ply. The shock absorbers are in the form of coil springs.

tank by a hand pump mounted on the port side in the pilot's cockpit.

### Instruments.

Fig. 4 shows, in perspective, the whole front portion of the Berg. Underneath the turtle-back, which has been shown broken, will be seen, in front of the wind screen, the instrument board. Few of the instruments were in place when we examined the machine, and there were no indications

passing on each side of the longitudinal tubular rocking shaft. From upper and lower ends respectively of this fork pass the top and bottom cables of the elevator controls. A transverse bolt forms the pivot around which the control lever oscillates in a fore-and-aft direction. The longitudinal rocking shaft is carried in two bearings, the front one mounted on the bulkhead in front of the pilot, and the rear one carried on two short tubes sloping up from the floor of the cockpit.



The aileron control cables are attached to a crank passing down from the fore end of the rocking shaft. The effect of this arrangement is that the positive cable—that is to say, the cable that passes from the controls to the aileron—raises an aileron, while the return cable lowers an aileron. Why this arrangement has been adopted is not clear, unless it is assumed that the upturned tip of the ailerons has the effect of putting one aileron under a negative load before the corresponding aileron on the other side begins to exert a positive lift.

The rudder bar of the Berg is welded up of sheet steel. It is of T shape, as shown in the sketch, the control cables passing from the base of the T instead of from the ends of the main cross bar. The foot bar is mounted on a cone of sheet steel, and is prevented from oscillating by a guide on each side, mounted on two short lengths of steel tubing. The base plate of the rudder bar cone has at its rear a lug, to which is attached a short length of cable that is bolted at its other end to the lower end of the control column. This cable has the effect of limiting the amount the control lever can be pushed forward, and has probably been incorporated in order to prevent the elevators from hanging down too low when the machine is on the ground. The rudder cables, after leaving the foot bar, pass over pulleys

proportions and position of the undercarriage. The track, as nearly as it has been possible to judge, has been about 6 ft., and the tyres are marked 760 by 100.

The tail skid is of the simplest possible form, and does not in itself present any unusual features. The manner of mounting it is, however, rather different from the majority of machines. As shown in Fig. 8, the swivelling skid is pivoted on a short forked member, which is in turn carried at the truncated end of a structure of light wooden strips covered with 3-ply. This structure is of good stream-line form, and although appearing very light, seems to stand up to its work quite satisfactorily. The details of the arrangement will be obvious from the illustration. Springing of the tail skid is provided by coil springs of similar type to those employed for the pilot's safety belt and for the foot guards on the rudder bar, *i.e.*, a smaller spring is placed inside a larger one, and the whole is made up into the form of a ring, one loop of which passes over the free end of the tail skid, while the other is resting on a stub having a bell mouth, and which is mounted on the lower corner of the fuselage.

#### Tail Planes.

The tail planes of the Berg are built up throughout of steel tubes. As distinct from the majority of German machines

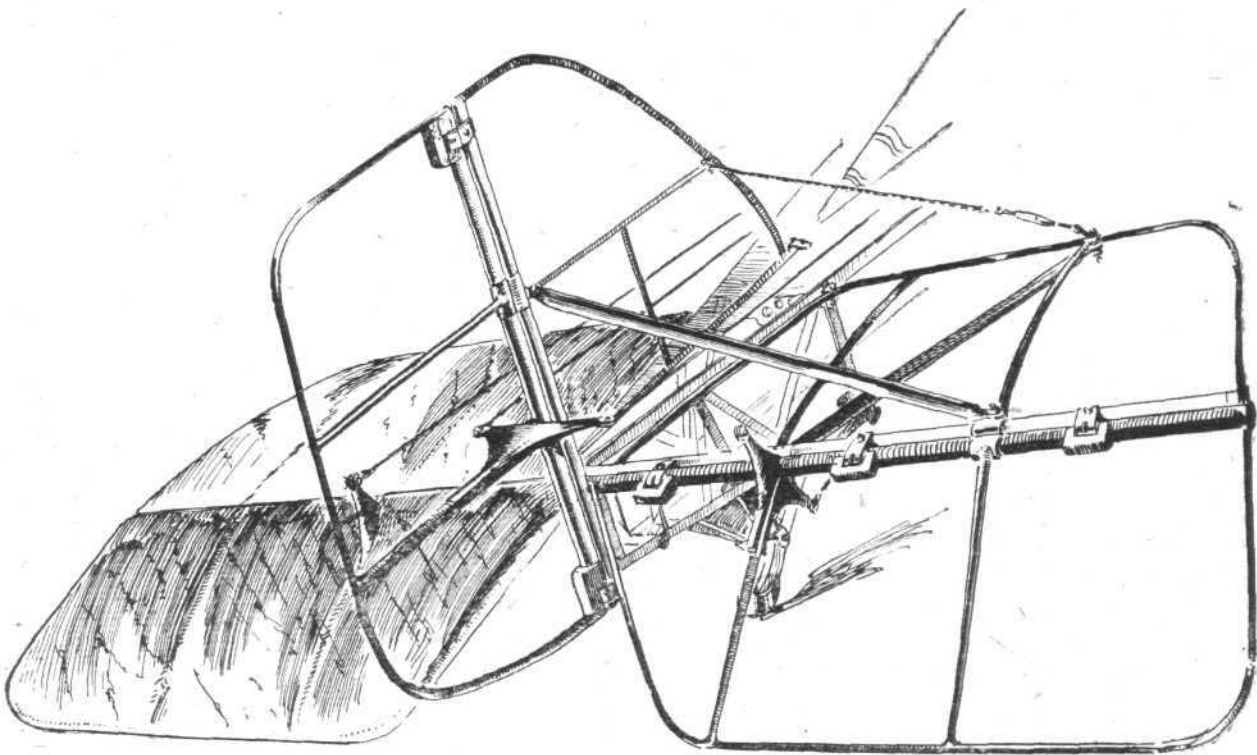


Fig. 9.—The tail planes of the Berg single-seater.

near the floor, on the sides of the body. These pulleys are indicated in Fig. 5, and one of them is shown in detail in Fig. 6. The pulleys are carried on simple sheet steel brackets bolted to a wood base. The pulley is surrounded with a guard to prevent the cable getting wedged between the pulley and the brackets.

Where the elevator and rudder cables pass through the 3-ply sides of the body, they are provided with guides of the form shown in Fig. 7. On the inside of the body the guides are in the form of wood blocks shaped to the angle of the cable as shown in the bottom sketch, while on the outside the guides are made of thin sheet steel, screwed at each end to the 3-ply. The top sketch of Fig. 7 shows one of these.

#### Undercarriage.

Although in the machine on view at the Enemy Aircraft View Rooms the undercarriage is not in place, there are sufficient of its component parts available to show that it is of the Vee type with struts of stream-line steel tubes. These tubes have been welded at their upper ends to base plates on the lower longerons, and in all four struts this welded joint has given way in the rough landing. The manner in which the struts were joined at the lower end is not apparent from the fragments available, and all it has been possible to do by way of reconstruction is to indicate, as was done in dotted lines in the general arrangement drawings and in the side elevation of Fig. 1, published last week, approximately the

in which steel tubing is employed for tail planes, those of the Berg are of fairly large diameter, but are everywhere single, whereas in many German machines the diameter of the tubes is very much smaller, but two used to form a rib. The Berg tail plane is slightly cambered, but owing to its construction of single tubes the upper and lower cambers are parallel. Provision has been made for varying the angle of incidence of the tail plane to a small extent, but not during flight. The divided elevator is similarly built up, but is, of course, perfectly flat. The tail plane is brazed to the vertical tube forming the stern post and to the bottom longerons of the fuselage. On top there is a stream-line strut joining the rear tube of the tail plane to the vertical stern post, and a cable bracing the tubular leading edge to the vertical fin, as shown in Fig. 9, while underneath the strut is in front and a cable at the rear. Thus on the tail plane a strut on top is balanced by a cable underneath, and *vice versa*. The lower bracing members of the tail plane come to a point on the fuselage. This was indicated in the general arrangement drawings and also in Fig. 1, published last week.

The vertical fin is formed by a light structure of steel tubes, and to its rear edge is hinged the rudder, which is constructed on lines similar to those of the tail plane and elevator. Wood blocks spanning the hinges are provided for the attachment of the fabric covering.

(To be continued.)

# AIRISMS FROM THE FOUR WINDS

To the man-in-the-street in France the "ace" of the moment is a vivid and well-known personality, and the omnivorous newspaper reader is regaled daily with accounts of what his hero eats, drinks or smokes, and how he spends his time when not effecting "victories glorious." But this hero-worship has surely never been carried farther than in the case of a French colonial soldier, who had a practically life-size head of the great pilot, Guynemer, tattooed on his back, which was already by way of being an academy.

THERE have been aviator-poets before, but most of them have been mere "versifiers," and whatever their prowess in the air, their prosody has been a thing over which to weep. Lieut.-Col. P. Leclerc, who is in command of an aviation camp near Paris, has stronger wings than most of his compeers, as this verse, for the use of which we are indebted to *L'Auto*, bears witness:—

Drape sinople, argent, comme un beau palefroi,  
A ses flancs la cigogne, embleme d'escadrille,  
L'avion de combat dans l'air floconneux sille,  
Chez l'aigle aux croix de fer portant le desarroi.

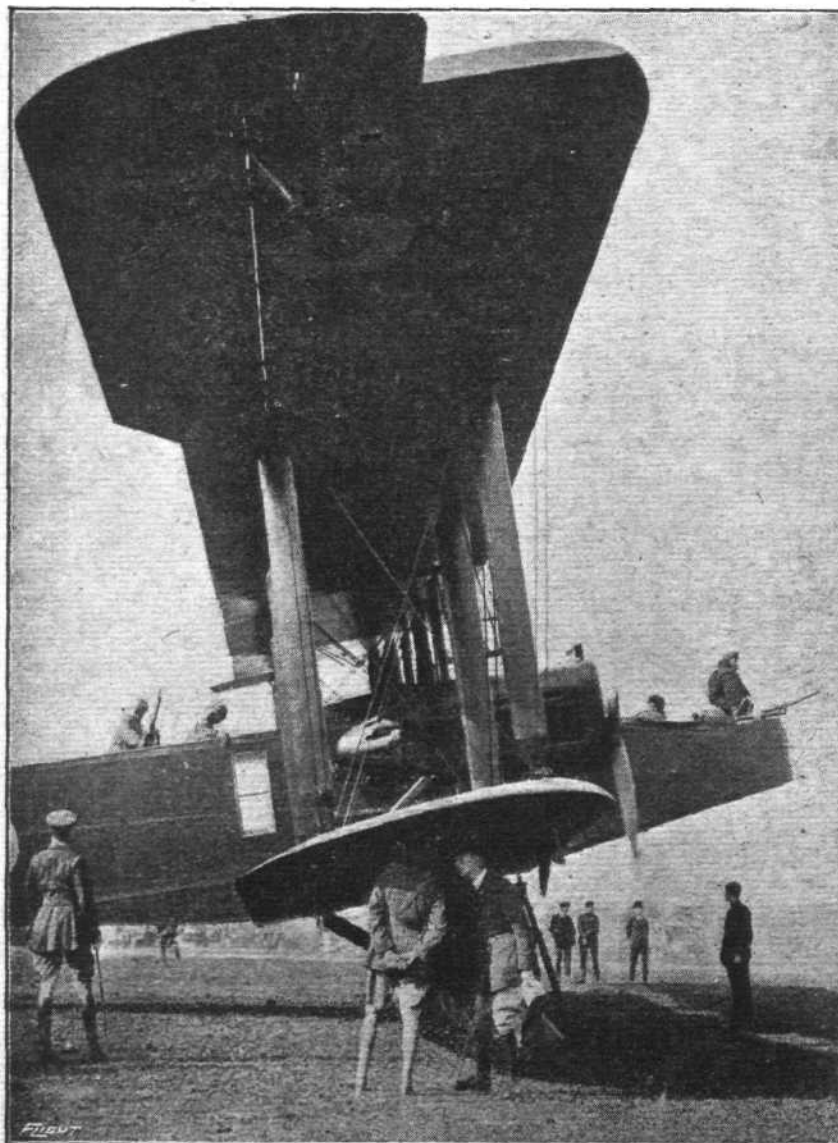
Des hauteurs de l'azur dont il semble le roi,  
Et pareil au gerfaut, tiercelet de Castille,  
Il attaque avec rage, il frappe, feinte, vrille,  
Fonce, semant soudain la terreur et l'effroi.

L'ennemi fuit devant la fureur qui l'emporte,  
Et des oiseaux presses en vibrante cohorte  
Plus d'un tombe meurtri sous l'acier crepitant.

Lamort qui l'accompagne est passee en rafales,  
Et portant trois couleurs,—dans le ciel eclatant  
Glissent avec fierte les ailes triomphales.

HOWEVER strange it may appear, there are still firm believers in the story that Lord Kitchener, one of the early advocates of aircraft in war, is even now amongst the living. A very horrible side-light has this week been thrown upon what led up to the calamity, through a statement attributed to Mr. Henry Mapp, head of the Salvation Army in Russia. Mr. Mapp, who has just returned to New York, declares that the Tsaritsa maintained a private wire connected with Potsdam, and by this means divulged all the Allied secrets to Germany. A special message, Mr. Mapp states, was sent to the Kaiser in regard to the sailing of the warship on which Lord Kitchener made his last voyage.

THERE is sound common-sense in the resolutions just passed by the Conference of the Inter-Allied Parliamentary Committee, urging the necessity of constituting an Inter-Allied Independent Air Force to overcome, if need be, the last resistance of the enemy by a campaign of raids over his



H.R.H. Capt. Prince Albert crosses to France in an "H.P." with Major Greig as pilot. Prince Albert and Major Greig are seen in flying kit, and, in the 'plane (at the rear), ready to start.



territory, and suggests for this purpose common industrial control of the production of aeronautical material. The committee also requests the associated Governments to set up a Commission to make proposals for international legislation with the object of organising definite air routes. All of which good objects have been strongly advocated in the past in "FLIGHT."

EGYPT is to help lead the world in progress aviation. A proposal before the Egyptian authorities is being considered for the inauguration of an aerial post between Alexandria, Port Said, Cairo and Khartoum. Shades of General Gordon!

It would be a work of a supererogation to descant on the skill and courage of our air fighters at the front, but the frequency with which their flying exploits are recorded in one form or another has outshone their merits in another respect. In a word, they are good soldiers as well as good pilots, with a respect for discipline in no way impaired by the fact that, to a greater degree than any other branch of the forces, they are called upon to display individual enterprise, adroitness and bravery to a superlative degree. When discipline makes its call, however, they are in no way found wanting, and there can be no harm in calling attention now to an incident of the German retreat over the Vesle which provided one of the most thrilling episodes of the war.

THE order went forth that the bridge by which the Huns were crossing must be destroyed "at all costs." Up went a British pilot, but when he got into bombing position he was shot down. Another followed, only to share the fate of the first. Machine after machine went up, but one after another came crashing to the ground. The Huns had posted two 12-inch howitzers, the shells from which converged to a point immediately above the bridge, and no pilot flying low enough to make sure of his mark could escape the area of tremendous concussion caused by the explosions. Still, the attack on the bridge was maintained without a falter, a pile of crashed machines meanwhile accumulating on the river banks, until at length the bombs found their mark and the deed was done.

BUT at what a cost! Incredible though it may appear, more than 30 machines had been brought down by the howitzers before the bridge was destroyed. Up to the time of this incident it had been supposed that a performance of the Royal Engineers, early in the war, was the outstanding achievement in the way of pure heroism. A bridge which we had crossed during a retirement had to be blown up, and 11 men in turn were killed in attempting to fire the charge; the twelfth reached the bridge unscathed and effected his desperate purpose. But for over 30 pilots in succession to attempt the all but impossible at a given spot, in the execution of a specific order, is surely the last word in splendid devotion to duty.

OF a different order, but equally illustrating the spirit by which our pilots are animated, was the case of a man who went back to work after a truly horrific experience. His machine caught fire in the air, and with flames gradually enveloping him he decided that sudden death was preferable to being roasted alive. He took out his revolver and pointed it at his own head, but his right hand by this time was so badly burned that he could not pull the trigger. Meanwhile the machine came to earth, and, as it happened, he was neither killed by the crash nor did he die from his burns. His spirit was unquenched, and the moment he recovered from his injuries he started flying again over the German lines.

Two days' journey in two hours. Comment is hardly necessary for pointing the moral of the following "short story" from Mr. G. Ward Price, writing last week from the Macedonia British Headquarters:—

"I came back yesterday afternoon from Sofia to Salonica in an aeroplane. The journey by air is of two hours only.

"Before the war when I travelled from Sofia to Salonica by train it took two days. The Staff officers of the British Army in the Balkans make more personal use of aeroplanes than probably the officers of any other army in the war. A personal conference may be needed, for instance, with the Commander of one of our Army Corps, whose headquarters are 80 miles away. To get there and back by motor car, mostly over the rough Macedonian roads, would take the whole day from dawn to dusk. Instead, the Commander-in-Chief, or his Chief of Staff, will start midway through the morning by aeroplane, arrive in one hour, have an hour's conference, and be back at General Headquarters by 1 o'clock."

WONDER where "Dora" comes in over the communications to the Press of the Committee on War Damage, through its chairman, Mr. Mark H. Judge, in regard to the returns of casual-

ties which have resulted from enemy air raids and bombardment, about to be presented to the Government. Or is the scheme official? It is, anyway, an excellent bit of work which the Committee seem to have in hand. The returns are from areas having a population of more than 1,250,000. The idea is that town clerks and clerks of urban and rural areas which have been attacked and from which returns have not been made should at once send in to the honorary secretary, Mr. W. H. Southon, 40, Chancery Lane, London, W.C.2. The particulars to be included in the returns are:—(1) Date of each attack; (2) number killed; (3) number wounded; (4) estimated cost of making good damage to property. Information is also desired of cases where there were attacks and no material damage done.

We fancy somehow "Dora" forbids the collection of these sort of facts, whether for publication or the reverse.

"DAGONET," in last Sunday's *Referee*, has an interesting "recollection" of Frederick Marriott, a well-known journalist in the early Victorian days, and his association with the early history of air navigation. Marriott, after many vicissitudes of a journalistic character and otherwise, made his way to California, writes "Dagonet," and there eventually started the *San Francisco News Letter*, by which he made a fortune.

"But I am thinking," "Dagonet" continues, "of Marriott now on quite a different plane of existence—namely the aeroplane. Somewhere in the early 'forties Marriott had become interested in a scheme called the Henson Aerial Steam Navigation Carriage, which was to be steered through space. Everybody laughed at the idea of aerial navigation, and Marriott lost all the money he put into it, but to the day of his death, which occurred in the late 'eighties, he believed in it. I remember that my old friend Henry Vizetelly, writing in 1893 of the *San Francisco News Letter* and Marriott, said, 'To the last he clung to his aerial navigation fad, to advance which he had floated a company in the Far West, but with his death, Aero-Plane scrip, of not much account before, passed beyond the realms of Stock Exchange quotation.' Poor old Marriott! He put money into aeroplanes in the early 'forties. He floated an aeroplane company in the late 'eighties. Nobody believed in navigable flying machines but himself and a few friends who were looked upon as crack-brains. And to-day we are told that after the war we shall be able to travel to Australia by air."

FROM Hobart, Tasmania, a quaint enquiry is to hand. After reading the communication through a second time, we are still in doubtful mind whether our correspondent is pulling our leg or whether it is a wheeze for getting editorial mention of an article of commerce. Anyway, here's our reader's letter, and if anyone feels competent to advise upon the subject, why send along to the editor and he'll do the rest:—

"Having lost some racing pigeons through the striking of hawks, I was thinking of camouflaging the top surface of my birds. Would this have any effect on the judgment of the hawk in finding the pigeon's speed? The red chequer is not so easily struck as are birds of blue and black colours. The majority of birds that are hawk-struck over in Hobart are blue chequers.

"Could you advise me as to what colours I should use, and the best way to camouflage?

"Thanking you in anticipation,

"Believe me to be yours sincerely,

"P.S.—Would diamond dyes do?"

A BUSINESS suggestion the other day by a sound business man is illustrative of the trend of aviation to enter into the ordinary routine of the world's doings in the future. Mr. John Robertson, joint general manager of the Northern Assurance Company, at a meeting of the London Insurance Institute on Monday evening, gave voice to the hope that "insurance companies will soon include in their prospectuses insurance against risks to machine and to life and limb in travelling in the air, which, after the war, will be one of the commonplace of everyday existence."

#### TEN YEARS AGO

Excerpts from "FLIGHT" of October 24th, 1908.

#### COLLAPSE OF BRITISH ARMY AEROPLANE.

Early on Friday morning, October 16th, Mr. Cody took the machine out with the intention of making an actual flight, and, starting against a ten-mile breeze, the elevating plane was lifted when a speed of about thirty miles an hour had been attained. Immediately the aeroplane rose from the ground, and flew steadily onwards through the air, but when an attempt to turn was made in order to avoid some trees in the line of flight, the machine lost its equilibrium, and crashed heavily to the ground upon its left wing.



## BOOK REVIEWS.

### "THE BOMBING OF BRUGES"

CAPTAIN PAUL BEWSHER, D.S.C., R.A.F., disarms the critic of his new book by his frankness, for one of the best of his poems starts:

"O judge me not by flight-inspired verse!  
It is a farthing found inside my purse,  
Whose azure silk is filled with magic gold,  
Which can ten thousand magic tales unfold."

Again in another piece he warns us:

"No gold of poetry will deck this tale."

Nevertheless it must be admitted that there is some good poetry in the book. Capt. Bewsher is no mere jingler, although in his eagerness to catch a rhyme he is occasionally betrayed into writing pure bathos, and here and there he takes liberties in rhyming.

In spite of its imperfections, however, we are glad to have this little collection of Capt. Bewsher's poems, for, good as his work is at present, there is promise of still better to come. He may not have won yet what M. Rostand has designated "the blue laurel of the air," but he appears to be in a fair way to attaining that distinction. He shows that there is poetry in "the cloudy chapels of the sky," and that aerial warfare—hideous though it may be—cannot frighten the muse into silence.

Night-bombing was a speciality of Capt. Bewsher, and the dodging—

"Of rigid searchlights in a flaming ring,  
And glittering balls of green . . . string after string."  
have inspired some vividly descriptive writing.

In one of the few poems which have not to do with the war, "The Death of Romance," those who love the countryside are warned that if they go a-flying—

"The hidden secrets of the lane  
Will not again the old joys bring."

The book is published by Messrs. Hodder and Stoughton, at 5s. net.

### "AIRY NOTHINGS"

IMITATION may be the sincerest form of flattery, but the real thing is generally preferable. So it is with Capt. Barber's little book. It is evident that he reads his Kipling, but—to put it briefly—we prefer Kipling at first hand. We also have another grievance against Capt. Barber, inasmuch as—quite unknowingly, no doubt—he has borrowed the title of one of Jessie Pope's delightful little volumes of humorous verse. It is a pity, for such a title infers that the writing is lightsome and inconsequential, which could hardly be said of Capt. Barber's book.

Frankly, the book is a disappointment. Capt. Barber, as readers of "FLIGHT" know, is one of the pioneers of aviation, and the tablets of his memory must be plentifully stored with much that should be both interesting and instructive. Yet the things he amused himself by jotting down during a fortnight's leave at Torquay are but poor stuff.

Of the half dozen sketches included in the book perhaps the best is "Dream or True Vision," picturing the trial trip, in 1928, of a new aerial liner between London and Athens at a speed of 300 miles an hour and at an altitude of 70,000 ft. "Early Day Finance" is also good, and will be specially appreciated by those who have observed the interest which company promoters are taking in matters pertaining to flying.

The book concludes with a rhapsody which reminds one of the piquant comment of the charming Scotch-American child in Neil Munro's "Daft Days." It looks as though it might be poetry with the lines all wiggly at the ends, but there's no zip in it.

The book is published by Messrs. McBride Nast and Co., at 3s. 6d. net.

### "MAGNETISM AND ELECTRICITY"

STUDENTS of electricity have anything but an easy time reconciling some of the explanations in text-books with the latest expositions of scientists, and on this score they will welcome "Magnetism and Electricity," by Mr. H. E. Penrose, which has just been published by the Wireless Press, Ltd. In a series of 50 lessons Mr. Penrose treats his subject on novel lines, and sets forth the facts relating to the elementary principles of magnetism and electricity in a simple form by ascribing electro-magnetic causes to electronic action in ether. He has rigorously excluded matter of purely historic interest, and his method is so vivid and interesting—one might almost say entertaining—that the

atmosphere of drudgery usually associated with text-books is not evident. Mr. Penrose has an easy facility in elucidating difficult theoretical questions, but here and there this has led him into a looseness of language and the use of unfortunate analogies which are apt to be misleading to an unwary student. His diagrams—of which there are no less than 224—are wonderfully clear.

The book is one which should prove useful as an introduction to the study of electricity in any of its applications, but those who are taking up wireless telegraphy will find they are particularly catered for, the numerous problems connected with inductance, for instance, usually avoided in an elementary treatise, being explained in a manner which is both novel and lucid.

Each of the 50 chapters or lessons is preceded by a list of simple and inexpensive apparatus by the aid of which the student may demonstrate for himself the truths set forth, and at the end of each chapter is a list of questions to be answered before the next stage is entered upon. Bound in cloth the book is priced at 5s.

### "MILITARY OBSERVATION BALLOONS"

KITE-BALLOONS are a familiar sight to-day, but few people have a clear conception of the important part they are playing in the warfare on land and sea to-day. Of a shape that comes near to being ludicrous, they do not appeal to the imagination as do the speedy aeroplanes and the graceful airships. It is recognised, however, that kite-balloons, and also spherical balloons, can be utilised effectively in modern warfare, and doubtless this branch of military aeronautics will be further developed.

The literature on the subject is scanty, but a recent book is "Military Observation Balloons," by Mr. Emil J. Widmer. The military kite-balloon was invented by a German officer, Major von Parseval, and Mr. Widmer has based his book on the Balloon Manual, including drill and equipment, in use in the German Army before the war. A full description, with drawings, is given of a kite-balloon and its equipment, explaining, in detail, the function and construction of the various parts. Then follow an explanation of the duties of the officers forming the crew; the procedure with regard to inflating, anchoring and ascension; the training of a field balloon company and the handling of a balloon during manoeuvres. There is a chapter on the use of a kite-balloon in time of war, and two chapters deal with materials used in the making of balloons, the care, maintenance and repair of them, and the rules for examining balloon cloth.

The last two chapters are devoted to captive and free spherical balloons respectively, describing their construction, detailing their equipment, and outlining the methods adopted in their inflation, ascension, &c.

The book, which is illustrated by 3 plates and 38 line drawings, was produced in the United States, and is being published in Great Britain by Messrs. Crosby Lockwood and Son at 12s. 6d.

### "BUYING SYSTEMATICALLY"

IN these days when it is essential to avoid any delay in delivering the goods which will help to win the war it is more than ever necessary for those in charge of works to ensure that adequate supplies of materials and components are kept up. That the importance of this side of a modern works organisation is becoming increasingly recognised is shown by the attention which is now given to the subject. Even those who have organised special departments for dealing with buying and the keeping up of stocks will doubtless find much to interest them in a little book which Mr. G. H. Mansfield has written under the above title. It is unnecessary to remind readers of "FLIGHT" that Mr. Mansfield has for years made a study of works organisation in its various phases, and his position as head of a successful concern supplying small parts, etc., has given him unique opportunities of appreciating the needs and requirements of buying systems. He has, therefore, outlined a system which, while it should be especially useful to those responsible for purchasing supplies for the various aircraft factories, has been devised with as much elasticity as possible, so as to render it useful to small and large firms alike. He points out that, as with every system, it cannot be expected to work itself, but with good intentions, coupled with keen interest, the system described should be the means of saving much time and trouble, where adopted. In paper covers, the book can be obtained from the Aircraft Supplies Company, Ltd., 125 Long Acre, W.C. 2, for 2s. 6d. net.



# Personals

## Casualties

Capt. HUGH WILLIAM EAMES BARWELL, M.C., R.F.C., reported missing on March 25th last, now presumed killed on that date, aged 25, was the son of Mr. William Barwell, of 26 George Road, Edgbaston. Captain Barwell was awarded the M.C. and the Croix de Guerre for conspicuous gallantry and good service at Beaumont Hamel in November, 1916. He was educated at West House School, Edgbaston, Oundle, and Birmingham University, where he took the degree of B.Sc. just before the outbreak of war. He joined at once, and was given his commission in the 11th Royal Warwick Regt., and served two years in France, being promoted captain in December, 1915. In July, 1917, he was transferred to the R.F.C. His youngest brother, Sec. Lieut. H. E. Barwell, R.F.C., was killed while flying abroad last February.

Lieut. JOHN LEDGER BROMLEY, M.T., attd. R.A.F., who was killed on September 29th in the enemy lines, whilst flying, aged 21, was the elder surviving son of Mrs. Bromley, Craigmoor, Rhyl. His brother was killed on September 25th, 1915, at the battle of Loos.

Lieut. R. A. BUTLER, R.E., attd. R.A.F., reported missing on July 20th, having been brought down in an air fight, and whose body has now been found at Obendorf, Germany, was the son of Mr. A. B. Butler, of High Street, Egham. Lieut. Butler was a Worcester cadet for two years, then served for three years as an apprentice at sea, afterwards obtaining a Second Officer's certificate and serving on several of H.M. ships. He was then transferred to the Royal Engineers, and saw 15 months as a lieutenant in France, when he was finally transferred to the R.A.F.

Lieut. SHERARD WILLIAM COWPER-COLES (Acting Flight Commander), R.A.F., who was killed in action on October 14th, aged 22, was the eldest son of William Burgoyne Cowper-Coles.

Lieut. DUDLEY H. HAZELL, The King's Own Royal Lancaster, attd. R.A.F., reported missing on September 27th and now reported dead, aged 23, was the son of Mr. and Mrs. Fredk. Hazell, Frinton-on-Sea.

Capt. HUMPHRY FRENCH FLOWERS, R.A.F., who was killed on October 14th, aged 22, was the youngest son of the Rev. J. F. Flowers, of Great Carlton, Louth, Lincolnshire. He was educated at Stancliffe Hall and Trent College, Derbyshire, and was given a commission in the R.F.A. from the Inns of Court, in August, 1915. He served with his battery in the Somme battle. He transferred to the R.F.C. in April, 1917, working first as an observer and later as a pilot. He was appointed flight commander a few weeks before his death. He was shot down "while putting up a splendid fight against a strong formation of German scouts which suddenly appeared out of the mist." His eldest brother, Field, fell last April.

Lieut. GEORGE WILLIAM EDENDALE WHITEHEAD, R.F.A., attached R.A.F., was the younger son of Sir George and Lady Whitehead, of Wilmington Hall, near Dartford, and grandson of the late Sir James Whitehead, Bt., and the late Sir William Ascroft. Born in 1895, he was educated at Cordwalles, Maidenhead, and at Clifton College, where he held two scholarships, represented the school at fives, was in the football fifteen for two years, and in the cricket eleven for four years (captain in 1913 and 1914). He held several Clifton records for cricket. For three years he represented the Public Schools against the M.C.C. at Lord's, and in 1914 played twice for the Kent first eleven. He was entered at Trinity College, Oxford, but on the outbreak of war decided to enter the Army. He passed high into Woolwich, being top of 600 candidates both in English and in Latin. He received his commission in the R.F.A. on July 28th, 1915, going to the front five weeks later, just in time for the battle of Loos, afterwards spending a winter on the Ypres salient, and taking part in the battle of the Somme in July, 1916. After a severe illness and operation which kept him inactive for 12 months he refused a position in this country, and answered the call for airmen, becoming a pilot in due course. At the time of his death he was doing an artillery patrol, and was brought down near the enemy's lines, both he and his observer being killed.

Capt. JACK BARNATO, R.A.F., who died on October 26th from pneumonia following influenza, was the eldest son of the late B. I. Barnato. Capt. Barnato, who was 24 years old, was one of the four naval airmen who in the early days of the war bombed Constantinople. He only recently celebrated the first anniversary of his marriage to Miss D. Lewis.

WILLIAM GEORGE COURTHORPE, who died on October 21st from pneumonia at a Military hospital abroad, aged 46, was the eldest son of the late Mr. and Mrs. W. J. Courthorpe, a member of the Inner Temple, and attached as Staff Captain, to the R.A.F., previously attached Bedfordshire Regt.

Capt. BRIAN CHARLES O'DRISCOLL DOUGLAS, Connaught Rangers and R.F.C., who was accidentally killed while flying on October 21st, aged 24, was the only son of Mr. and Mrs. James Douglas, of 96, Inverness Terrace, W.

Sec. Lieut. PHILIP RODERICK HALE, R.A.F., who was accidentally killed while flying in Scotland, on October 16th, aged 19, was the younger son of Mr. and Mrs. Cecil T. Hale, of Kingston Hill, Surrey. Although he served his country for so short a time, he had won distinction as being a most capable pilot.

Sec. Lieut. JACK HARDY, R.A.F., who died suddenly on October 21st from pneumonia following influenza, whilst on active service, aged 28, was the husband of Frances E. Cunliffe Hardy (*nee* Goodall), of Beechwood, Orpington, Kent.

Lieut. AUBREY CHARLES FINCH HILL, R.A.F., who died on October 24th of pneumonia, while on active service, aged 43, was the third son of the late Joseph Hill, of Streatham Hill, and husband of Elizabeth A. Hill, of Streatham (proprietor F. Foxley and Co., Bayswater).

Major GUY R. HOWARD, D.S.O., Essex Regt., attd. R.A.F., who died on October 24th at a casualty clearing station, was the younger son of Col. and Mrs. W. Howard, of East Lodge, Bexhill-on-Sea.

Sec. Lieut. ROBERT AUBREY HASTINGS LLOYD, R.A.F., who died of wounds abroad on October 14th, was the youngest son of Mr. and Mrs. E. W. M. Lloyd, of Hartford House, near Winchfield, Hants. Born on October 26th, 1899, he was educated at Hartford House School, Eagle House School, and at Rugby, where in the autumn of 1916 he gained his colours for the school football XV. He left Rugby in April, 1917, and went into an aircraft factory, where he worked until he reached the age when he could be admitted to the R.A.F. He obtained his wings at the earliest possible date, and was passed as a fighting scout pilot, going to the front last July. On October 10th he was mortally wounded while flying some miles over enemy lines, but managed to get back to the British lines. He died at a casualty station four days afterwards. He had already shot down one enemy machine in flames entirely unaided, and destroyed one other. Mr. Lloyd's elder brother, Lieut. W. H. Lloyd, R.E., was killed while on active service last April.

Capt. REGINALD VICTOR BYRON LOXLEY, who died in a hospital in Paris on October 18th, from pneumonia following influenza, was the brother of Capt. Noel Loxley, R.N., who went down in H.M.S. *Formidable* on New Year's Day, 1915, and of Major Vere D. Loxley, R.M.L.I., who was killed in action on November 13th, 1916. Capt. R. V. B. Loxley, who was educated at Radley, served in the Gallipoli campaign and was afterwards invalided to England. He went out to France on the formation of No. 3 Wing, R.N.A.S., as assistant transport officer, and served there during the whole time No. 3 Wing was in France. Subsequently he was appointed transport officer at a British flying school in France. From there he was appointed executive officer to an R.N.A.S. squadron. He served there for some months, and was afterwards appointed adjutant to the Department of Aircraft Production, Paris.

Flight-Cadet SPENCER HAROLD MILLARD, who was accidentally killed while flying on October 17th, aged 18, was the second son of the Rev. F. L. H. Millard, Vicar of St. Aidan's, Carlisle, and grandson of the late Chancellor Ferguson, M.A., F.S.A.

Sec. Lieut. LOUIS RICHARD MUMFORD, R.A.F., who died on October 21st, at the Military Hospital, Belton Park,

Grantham, aged 27, was the third son of Stewart T. and Grace A. Mumford.

Capt. FRANCIS GRANGER QUIGLEY, D.S.O., M.C., R.A.F., who died on October 20th at Liverpool, was the youngest son of the late R. J. Quigley, of Toronto, Canada.

Lieut. HERBERT WESTGARTH SOULBY, R.A.F., who was accidentally killed on October 19th, was the elder son of Mr. and Mrs. H. W. Soulby, of 39, Ellesmere Road, Chiswick.

#### Married

Lieut. KENNETH ERIC JUDD, R.A.F., youngest son of G. W. Judd, I.S.O., Karachi, was married on October 24th at St. Bartholomew's, Sydenham, to MAY HENRIETTA, second daughter of Henry Charles PLATTS, A.M.I.C.E., and Mrs. Platts, of Hazelwood, Sydenham.

Capt. JOHN ALFRED MANSFIELD, R.A.F., son of the late John Mansfield, Esq., of Stonehouse, Gloucestershire, and Mrs. Bryan, of King Hill, West Malling, Kent, was married on October 24th at St. Marylebone Parish Church, to KATHLEEN MARGARET (PEGGY), daughter of Lawrie McGAVIN, F.R.C.S.Eng. (late 6th Dragoon Guards), The Carabiniers, and Mrs. McGavin, of 32 Weymouth Street, W., and Morton Bagot Manor, Studley.

#### To be Married

The engagement is announced between Lieutenant MONTAGU R. CHIDSON, R.G.A., R.A.F., only son of Mr. and Mrs. Henry A. Chidson, of 11, Saekville Street, Piccadilly, and 4, Matheson Road, W. 14, and MARIE JOSEPHINE (BETTY), only daughter of M. and Mme. G. A. L. M. E. DE BRUYN, of Rotterdam.

#### Items

It was announced in the *Court Circular* of October 23rd that the LORD WEIR (Secretary of State for the Royal Air Force) had an audience of His Majesty the King at Buckingham Palace.

SIR JOHN SIMON was last week gazetted out of the R.A.F. with the hon. rank of major.

Mr. B. Griffith, of Bron Awel, Ruthin, would be deeply grateful for any information regarding the fate of his son, Sec. Lieut. D. B. GRIFFITH, R.A.F., who was reported missing on July 19th last, and subsequently reported dead, but not confirmed. The machine he was flying when he failed to return was a Sopwith Camel, and he was attacking a German aerodrome on the Somme.

## AVIATION IN PARLIAMENT.

### Woolwich Arsenal.—Commander Colomb's Charges

BRIGADIER-GENERAL CROFT, on October 22nd, asked the Prime Minister (1) whether his attention has been called to the charges of Commander Colomb, R.N., with reference to the protection of young men employed in responsible positions at Woolwich Arsenal and the favouritism alleged towards certain relatives of officials; and whether, having regard to the fact that there is a direct conflict of evidence between the Ministry of Munitions and Commander Colomb, he will cause an independent inquiry to be set up, as requested by the Shoreditch Tribunal; (2) asked the Under-Secretary of State for the Air Ministry whether his attention has been called to the dismissal of Commander Colomb, R.N., from the supply branch of the Air Board; and whether such dismissal was due to the fact that Commander Colomb had reported to the Shoreditch Tribunal certain matters in connection with the comb-out of Woolwich Arsenal?

The Parliamentary Secretary to the Ministry of Munitions (Mr. Kellaway): Commander Colomb was employed at Woolwich Arsenal from January 23rd, 1917, to March 20th, 1918, and commenced work in the supply department of the Air group of the Ministry of Munitions on the day after he left the Arsenal. His services in the Air Department were terminated because, without permission of the Ministry, he communicated to an outside body a criticism of the administration of another branch of the organisation in which he was working. He thereby committed a serious breach of discipline. The substance of Commander Colomb's complaint was that certain men in the Department of Woolwich Arsenal, in which he was formerly employed, were protected from military service because they were related to persons in authority. Careful investigation of these statements showed that they were unfounded. Commander Colomb further suggested that in engaging new hands, due consideration was not given to the claims of discharged soldiers. This statement also is unfounded. In May and June of this year, which were typical months, 522 men were engaged, of whom 343 were discharged soldiers—a very high proportion, considering that much of the work cannot be done by disabled men. In view of the careful investigation already made my right hon. friend does not consider that any further inquiry is called for. If my hon. and gallant friend desires, I shall be glad to send him a detailed reply on each of the points raised by Commander Colomb.

General Croft: Has the hon. Member's attention been called to Commander Colomb's further reply in which he states the actual names of these assistant foremen; is it not a fact that a large majority of them are of military age; and that five of them are related to foremen and others in high positions; and has he any answer to make to this last charge?

Mr. Chancellor: Is the inquiry of the kind asked for, namely, an independent inquiry and not one by officials?

Mr. Kellaway: With regard to any second statement by Commander Colomb I have not had my personal attention drawn to it, and I cannot deal with it now. We had the names of all the foremen before us, and we found that the allegations, as far as they were concerned, were unfounded. The inquiry was a departmental one, and not a public inquiry.

Colonel Ashley: It is not only the foremen who are concerned, but is a question of those foremen having given to their friends and relations all sorts of jobs.

Mr. Kellaway: I was asked with regard to the foremen and my answer was in reference to them.

Mr. George Terrell: Will the hon. gentleman consent to a further inquiry by some impartial person?

Mr. Kellaway: If new facts are elicited I shall be glad to have them inquired into, but it would be an impossible situation if in every case of a difference of

opinion between a minister and an official we have to hold an independent inquiry.

### Rabies and Aeroplanes

SIR WILLIAM BULL asked the President of the Board of Agriculture whether he is aware that a British officer flew over from France with a lady's dog which, it is alleged, spread rabies in Devon; and, if so, what punishment will be meted out to this officer for evading the law?

Mr. Prothero: The Board have no knowledge of the circumstances to which my hon. friend refers, and if he will send me his information I will have it investigated. In January and February, 1917, the Board called attention to this possible source of risk, and both the Admiralty and the R.F.C. gave every assistance by warning officers of the serious breach of regulations involved.

Sir W. Bull: Has not a barrister of standing communicated the name of the officer and the date upon which the occurrence took place and the name of the dog?

Mr. Prothero: Not to my knowledge. It has not been communicated to me or in such a way that it would reach me.

Mr. Lambert: How did this outbreak of rabies in Devon and Cornwall first occur?

Mr. Prothero: That is just the difficulty. I cannot explain it. I may have suspicions, but I should not like to say on suspicion what I believe the case to be. It is mainly centred in the county borough of Plymouth.

Mr. Chancellor: Has any death resulted from any of these bites from rabid dogs?

Mr. Prothero: Not at present.

### Austrian Threats against Leaflet Droppers

MR. JOYNSON-HICKS, on October 23rd, asked the Prime Minister whether his attention has been called to an Order issued by the enemy to the effect that British aviators who drop leaflets over the enemy lines will, if caught, be sentenced to death; and what steps he proposes to take in regard thereto?

Mr. James Hope (Lord of the Treasury): His Majesty's Government have received no official corroboration of this Order, which appeared in an Austrian newspaper. We are, however, informing the Austrian Government that should such an Order as is described have been issued and be carried into effect, the sternest measures of reprisals will be instantly taken.

### The Royal Air Force

MAJOR NEWMAN, on October 24th, asked the Chief Secretary whether he will give the number of men who have been attested and passed for service in the Artillery, Cavalry, Infantry, Air Force, and non-combatant units of the Service, respectively, from June 1st to October 15th, 1918, under the Irish Government's scheme of voluntary enlistment; and will he say whether those recruited for the Air Force were men to be instructed in actual flying or to perform ground service only?

Mr. Beck: My right hon. friend has asked me to reply. The enlistments in Ireland from June 1st to October 15th were: Royal Navy, 626; Army, 4,712; R.A.F., 4,438, exclusive of absentees from Britain and exclusive of men who volunteered but were found unfit or who for one reason or another were not posted. The disposal of the recruits between the corps in the Army is not known to my Department.

Major Newman: May I have an answer to the last part of my question?

Mr. Beck: I think I had better have notice.

### Pooling of Allied Aircraft

FROM Washington via New York comes a report that an agreement has been reached after a series of conferences between Mr. Ryan, head of the United States Army Aircraft Division, and the British and French Air Ministers and Directors of Munitions regarding greater co-ordination in the handling of the Allied aircraft resources.

In the future, it is stated, each country will be able to produce its maximum capacity along the lines in which it is best equipped, and the fighting forces of all three air services will be supplied from this production. The air supremacy of the Allies is not questioned, but this plan is expected to render impossible the concentration by Germany of its centralised air fleet against any particular part of the Allied line.

### R.A.F. a Vital Influence

At the formal handing over at Glasgow on Saturday of the aeroplane "City of Glasgow" to Sir George Perley, High Commissioner for Canada, Lord Desborough, President of the Imperial Air Fleet Committee, read a message from Lord Weir in which he stated that the recent victories had created a situation wherein the air operations were rendered even more valuable than before. The R.A.F. had so developed as to be able to exercise a vital influence in determining the length of the war. In Palestine the air squadrons were the main instrument in converting a military defeat into complete destruction of the enemy forces. The R.A.F. believed they could best assist towards peace by continuing to hit the enemy as hard as possible.



# STEEL TUBES, TUBE MANIPULATION, AND TUBULAR STRUCTURES FOR AIRCRAFT

By W. W. HACKETT and A. G. HACKETT, of Oldbury, Birmingham

(Concluded from page 1205.)

## Tapered Tubes

**TAPERED** tubes could, in our opinion, be used in aeroplane construction to a much greater extent than at present, especially as struts or spars.

Alternating tests as follows were carried out at 400 revolutions per minute on 1 in. by 20-gauge steel tubing, using two parallel lengths and two pieces tapered  $\frac{1}{4}$  in. per foot. A weight of 111.56 lbs. was suspended on each tube at a distance of 12 $\frac{1}{2}$  ins. from the grips, giving 25 tons stress. The plain pieces broke after 20,585 and 30,390 revolutions respectively, as against 23,557 and 38,225 revolutions respectively by the tapered pieces. The weight of the plain tubes was 6 $\frac{1}{2}$  ozs. each, and that of the tapered tubes 6 $\frac{1}{4}$  ozs. each. In both cases the break on the plain tubes was straighter than on the tapered one.

There are several ways in which to taper a tube. A method much in use is that of swaging, but this is a most unsatisfactory way, as the tube is not kept round whilst being reduced. Swaging tools cannot be quite circular, as a certain amount of "backing off" must be given to them, or the tube will be pinched and crumpled. The continued deforming of the tube during this operation causes it to split if it is much reduced, and the steel is left brittle. Tapering is more successful if done on rolls, as it is then possible to keep the tube round, and the steel is left in a much better condition. In reducing the tube by tapering it is thickened in gauge roughly by about two gauges in a reduction of 50 per cent. of its diameter. A tube of 1 $\frac{1}{2}$  in. by 20-gauge would thicken to 18-gauge if tapered down to 9/16 in. diameter. If uniformity of gauge be aimed at, it would be necessary to thin the tubing before the tapering operation. This can be done by drawing. It is even possible to make a tube tapering both in diameter and thickness if such is required.

## Tubular Liners or Reinforcements

Considerable attention has been given to the matter of liners as reinforcements to tubes. In cases of trapped or flattened ends of struts a piece of strip steel is often inserted and soldered or riveted into position. This is not good practice, as the tube is not strengthened beyond the point at which it is flattened, and it is well known that, without some additional strengthening, a tube is always weakest at the point where the change of shape begins. If, before flattening, a tubular liner of a gauge equal to about half the thickness of the piece of strip steel is inserted to extend some distance beyond the trapped portion, a much better result is obtained. Various compression tests have been carried out from time to time, and the tubular liner has always proved to be superior. It is important from the standpoint of strength of leaving the walls of the tube untouched as far as possible along the flattened portion.

A liner, however, to be really efficient, should be brazed or soldered to the tube. A series of alternating stress tests has proved this point. Many liners used in tubular constructional work are not fixed, and consequently do not prevent the tube breaking, but may be sufficient to avoid accidents resulting from such breakages. Take, for instance, a front fork tube on a motor-cycle. The liner, often a long one, is put in because this tube has frequently failed at the lugs and serious accidents have occurred, but the position of the liner in the fork makes it very difficult to solder or braze in its place. However, if a fork tube should break, the liner will save the situation.

It is not wise to make a liner stronger than the tube it is to reinforce unless the ends of the liner are tapered off gradually or weakened by serrations. When the ends are serrated and the liner is not brazed or soldered into the tube this serrated portion is seldom of any value, as it quickly takes a "set" away from the tube when it has been subjected to a bending stress.

Perhaps the better way to reinforce tubular parts is by means of strengthening "sleeves" brazed or soldered to the outside of the tube. Although in appearance not so neat as when an internal liner is used, there is the certainty of being able properly to fix the sleeve in position. A drilled tube 1 in. by 20-gauge reinforced by a sleeve (in halves) 2 $\frac{1}{2}$  ins. long by 18-gauge thick, pressed into position over the hole, was subjected to an alternating stress test at 400 revolutions per minute. The sleeve expanded at the ends under the test and gradually became so "bell-mouthed" as to be of little practical use. The tube fractured across the hole at 9,320 revolutions.

A tube was cut from the same length and similar in all respects, but it had the sleeve soldered in position. This tube did not break until after 43,867 revolutions had been made, and then it failed between the sleeve and the grips.

Another piece of tubing, also from the same length, having a plain hole drilled through and not reinforced at all, failed across the hole after 3,684 revolutions.

The following is a tabulation of the results just described:—

Sleeve pressed on only	..	..	9,320 revs.
Sleeve soldered on	..	..	43,867 "
Without sleeve	..	..	3,684 "

These tests point to the fact that a sleeve merely pressed into position has little value, but that when fixed to the tube by soldering or similar means it acts as an efficient reinforcement.

Tests were carried out on three types of reinforced tubes. No. 1 is formed by drawing a round tube over two "D" section tubes. The tubes are firmly fixed together by drawing, but are not brazed or soldered. These combinations were designed to take the place of butted tubes in motor-cycle frames, which were failing through excessive vibration. Tests made on a shock-testing machine proved that this form of tubing had a much longer life under shock and vibration than plain tubing of the same weight. When a fracture occurred under test, which was always after a greater number of blows than the plain tube would sustain, it was only the outer member that was affected, the two "D" tubes being quite sound.

No. 2 is a triangular reinforcement formed by drawing an outer tube over three other tubes of the shape indicated in the sketch.

No. 3 has a cruciform reinforcement formed by four inner tubes.

A number of tests were carried out at the time on laminated tubes, formed by drawing one light tube over another, to take the place of a tube of the same weight as the two combined. Under the few tests made the laminated tubes withstood vibration and shock much better than the plain heavy-gauge tube. The only reason we can assign for this is that cold drawing hardens the outside of the walls of the tube more than the centre if the tube is a thick one, and by drawing together the two thin tubes to give the same thickness of wall the metal has the benefit of the double drawing operation. Further tests are necessary to prove or disprove this point.

## Tube Manipulation

The possibilities of tube manipulation such as butting, tapering, drawing with taper gauge, expanding, flanging, bending, lapping, &c., are becoming better understood. Some designers, however, whilst recognising the usefulness of these different operations, still ask for what is not commercially possible, because they fail to make allowances for the alteration in the thickness of the tube which will occur as the result of such operations. For instance, if the diameter of a tube is increased the thickness of the wall is reduced, and if decreased in diameter the thickness is increased. Again, if a tube is flanged, the flange will not be of uniform gauge, but will decrease in thickness as it increases in diameter.

A section of a bent tube was cut from an F.2.B. under-carriage "V" strut. The gauge of the tube has, by bending, been reduced on the outside of the curve from .061 in. to .048 in., and increased on the inside from .061 in. to .072 in. The thinning of the tube would cause it to break if it had not been properly annealed; and further, if proper mandrils had not been used, or the tubes had not been filled with suitable material, a series of "puckers" or "corrugations" would have been formed on the inside of the bend. Where proper thickening up of the wall along the inner curve takes place in bending the bent portion of the tube is the strongest, but if "puckering" takes place this point becomes the weakest.

Bending is sometimes carried out on steel tubes whilst in the hot state, but where strength is required this is bad practice, as by heating the tube is rendered much weaker than it would be if bent in the cold state. Two "V" struts were bent, one in the hot and the other in the cold state. The same weight was applied in each case, but the tube bent while hot was distorted much more than the other.

## Tubular Joints in Aircraft Construction

Generally speaking, structural work for aircraft purposes is to-day carried out by means of sockets placed in suitable



positions and arranged to receive the ends of the various tubular cross-members and bracings. These tubes and sockets are connected in three or four ways, namely:—By brazing, by silver-soldering, by soft-soldering.

Sometimes the sockets or lugs are dispensed with, in which case the cross-tubes are mitred and welded direct to the main tube.

The latter method is not advisable except in very rare instances, as any operation involving great heat is dangerous, owing to the weakening which results from the annealing or perhaps burning of the steel.

Another method is sometimes employed in which the cross-bracings are connected by means of a hinge joint to a sleeve on the main tube.

Reference may be made to four types of lugs used in aircraft structural work. Of these, "A" is perhaps the more common, the lug being made up by one long sleeve with two branches mitred and welded on. Into and through these the main and branch members are fitted, and are held there, preferably, by soft-soldering and pegging. "B" shows another form of lug, this being made in two halves, pressed to shape, trimmed to depth, and welded along the joints. A wiring key will also be noticed. "C" shows a three-way lug, with double wiring key, while "D" is arranged for the hinge cross-member.

It will be useful to give the results of some comparative tests made on these various methods of jointing tubular structures, but before doing so we would remark that, in a paper like this, only the fringe of the subject can be touched. Everyone who is in any way connected with the practical side of aeronautical construction will readily call to mind many other types of joints, each designed for a special purpose or to overcome a constructional difficulty.

Speaking from an experience of at least eight years, in which we have been in touch with aircraft construction and design, we have met with a surprising amount of fluctuation in the respective popularity of soldering, brazing, welding, &c., for steel tube work, all these methods having been ruled out in turn, only again to find favour in certain quarters. This is partly due to the fact that machines designed by private manufacturers have been brought into great popularity, and the methods and designs of such makers adopted.

We have seen welding carried almost to excess and then almost abolished. Brazing has been boomed and then decried, and soft-soldering substituted for it—with a different type of lug or joint to allow for the rescued strength of the flux. This again has been deemed unsafe, and silver-soldering, or hard-soldering, has risen into prominence, and to-day one hardly knows which type really is the popular one, as on the machines now being built for war purposes all styles and types of jointing may be found.

One has to realise that in all these methods the human element comes much into play. For instance, it is possible so to weld a joint that it appears to be sound, yet it may be a "fake"—metal being merely laid on and not fused with the surrounding parts. Or again, the welded joint may be burnt, thus causing a dangerous weakening.

Similarly with brazing, it is possible with care to make a fine type of joint, but the probability is that in a certain percentage of cases overheating will take place and failure result.

We will now deal with the results of a few experiments recently carried out on certain of these types of joints.

#### Soft-Soldered Joints

Let us take soft-soldering first. In all cases the tests were made with a soft-solder composed of 60 per cent. tin and 40 per cent. lead—using "Fluxite" or some similar article as a flux.

Tubes of various gauges were tried, but up to a certain point the strength of the soldered joint was such that the tube failed in tension without the joint giving way.

It will be seen from the above that the strength of a soldered joint is much greater than it is generally supposed to be, and from experiments carried out, the clearance or thickness of the soldering material does not, between the limits of .001 in. and .008 in. make much difference, but for any components that can be guaranteed to size we would recommend as "thin" a joint as possible.

A test on a joint of the type just referred to was carried out in order to prove to the satisfaction of inspectors that the stipulated minimum clearance of .005 in. on the diameter was not necessary. In this particular case the elevator lever was held stationary while a torsional load was exerted on the tube. The result speaks for itself.

One of the chief arguments against the use of soft solder is the reduction in strength resulting from vibration, it being claimed that this form of joint will not sustain a vibratory

load nor a series of shocks. This may sometimes be right, but even under these conditions a very satisfactory result can be obtained if the sweating is done thoroughly and well, and added strength is given if the joint be "pegged."

#### Tests on Soldered Joints

The writers recently carried out some experiments on what may be termed a "Tup-testing machine" for soldered and brazed joints. The rising and falling tup is actuated by a bell crank lever, worked by a "sudden-drop" cam rotating in the direction of the arrow. The dead load on tup shaft can be varied by means of the sliding weight.

A standard drop of 4 ins. was arranged for.

It was at first thought that the effect of the "tup" action would be to quickly rupture the joint, but to our great surprise the joint held to such an extent that we found it necessary during the test to increase the load from 10 lbs. to 24 lbs. The following are the details of the test:—Size of tube, 1 in. o/d. by 18-gauge; depth in socket (or lap),  $\frac{1}{2}$  in.; thickness of solder, .005 in.; number of blows, 113,500 with 10 lb. weight tup; further number of blows, 64,000 with 24 lb. weight tup.

At this stage the joint showed signs of giving way, so it was decided to apply a tensile test to see if the repeated blows had in any way deteriorated the solder. To our surprise the tube did not pull out until a load of 5.2 tons had been registered, giving the excellent result of 3.31 tons per super inch on the solder lining.

It may be possible to work out a formula to arrive at a basis for designers of soft-soldered joints, but even here, as in all calculations relating to structures, other factors have to be taken into account. For instance, a joint may be quite strong enough if in a 1 in. by 20-gauge tubular joint the solder reaches to a distance of  $\frac{1}{2}$  in., and working on this basis it follows that the same distance for a 2 in. diameter tube of the same gauge would be correct, but no one would be satisfied with this, and would naturally double the length of socket to meet the increased diameter.

Generally speaking, it may be taken for granted that with ordinary care, and with a good quality of soft solder, a joint can always be made to withstand a shearing stress of 2½ tons per super inch on the solder itself—provided (and this is the crux of the whole matter) that the articles are well tinned and cleaned prior to the operation of sweating.

As regards the apparatus for sweating, different people will have a different choice, but having tried soldering irons, blow-lamps, coal-gas jets, and hydrogen flame, we have found that the three latter are about equal, and each is better than a soldering iron alone, but this latter is necessary for finishing in awkward corners. Eventually the use of a simple electrical device will probably become popular for repetition work.

#### Brazing

As previously mentioned, this means of connection still has many adherents. There is, however, a great disadvantage attached to it, viz., the risk of burning the tube owing to the intense heat necessary. That this burning and consequent weakening does take place can be easily shown by the results of tests carried out by us on a cantilever testing machine.

The tests were upon tubes which had been fixed into sockets and brazed or soft-soldered, and showed the decided advantage of the brazed joint from the standpoint of strength.

Another point may be mentioned with regard to these tests. It will be seen that the result of Test No. 3 (soldered) is poor in comparison with the others. This joint is "faked," the tube and socket being left dirty and improperly tinned, in consequence of which the soldered joint had no "life." Even under these conditions the joint held for 75,130 revolutions, as against about 4,000 for the brazed joint. At this point the socket failed, due to the insecure fixing of the tube.

Another peculiar feature of this test was the heat generated in the brazed tubes due to the constant working of the molecules. The tubes commenced to warm up almost immediately, and before they broke the temperature of the tubes near to the points of fracture (i.e., near the socket) was about 120° C., sufficient to cause the charring of any adjacent wood, whereas the soldered tubes remained quite cool until the last few minutes prior to fracture.

We are quite aware that in many places on aircraft structures brazing is permissible and good, but where any weakening of a member is likely to cause disaster brazing should be carefully avoided.

#### Silver Soldering or Hard Soldering

The foregoing remarks as to brazing hardly apply to silver-soldering, as by this method a strong joint can be obtained with-



out undue heat. We are not in a position at the moment to give any comparative figures of tests, but we should say that, from the standpoint of tensile strength, silver-soldering is higher than soft-soldering, and very near to that of brazing. The heat necessary to perform the operation is lower than for brazing, and is not likely to weaken any members if reasonable care is used. It is, however, a longer process, and the material used is very costly.

### Welding

We may well ask ourselves, in these days, where we should be without some form of autogenous welding. The thousand and one articles that are built up of sheet metal welded together speak for themselves, and make us wonder how we ever got on without this useful engineering process.

Still, welding has its limits of usefulness, and if exceeded danger may be near.

In the early days of aeronautical engineering welding was often used in places and on parts where to-day it is "taboo," and such a method as welding tube to tube has dropped to a great extent out of favour, having been superseded by the more costly, but better and safer engineering practice of jointing by means of machined or built-up tubular sockets, previously referred to.

Welding—by whatever means it is done—is always open to a certain amount of doubt, and though there are innumerable cases where this doubt as to the strength of a joint is well covered for, yet, owing to the hidden nature of the defects of welding, and the possibility of burning and oxidation, present-day designers avoid it in any important member of an aircraft structure.

A most important rule introduced during recent years has been the suitable annealing of welded joints, and this rule should be adhered to whenever possible. Many will have noticed the brittleness of a welded joint before annealing or normalising, and the malleability of the same afterwards.

On this point the writers have discovered within the last few months a rather strange fact. We had occasion recently to make up some small lugs from which it will be seen that a certain amount of shortening took place as the result of the welding on of the arm. We have since noticed this shortening in other tubes, some of quite considerable length, where various fittings have been welded on at intervals, and so far we have not arrived at a satisfactory explanation.

For the sake of any who may not have been able to carry out their own tests on welded joints, it may be helpful if we here give the results of some experiments we have made.

The easiest method of welding is the butt joint, *i.e.*, when two tubes are placed end to end and joined together to form one length or mitred together to form one piece. In such a case the surfaces to be welded are readily accessible, and the flame has freedom for doing its work.

A more difficult type of welding is that necessary when one tube has to be mitred to the outside of another tube, as when forming a "T" lug. In this case the easily-melted end of the one tube has to be united to the outside surface of the other, and anyone who has had experience with welding will know how much more difficult it is to attack the hard outside skin of a tube or sheet than it is the edge.

In order to prove this point we carried out tests on tubes measuring 1 in. outside diameter by 20-gauge and 1 in. outside diameter by 16-gauge—some being butt-welded and others having an interposed tube of about the same diameter, to which the end of each tube was welded.

Comparative tests were made on a cantilever tube joined to the main member by welding, and a similar type of loading was also tested for a lug, with the tube fixed in place by welding.

The following were the results: Welded direct to tube, 335 lbs.; welded into socket, 365 lbs.

Welding is often harshly criticised as regards its ability to withstand vibration, but even in this respect we have

found striking instances where the tube has broken before the joint.

Some time ago we tried an intermittent shock and vibratory test on a machine which gave a series of vibrations to the tube, the blows due to the "peg-cam" being 1,400 per minute. In some cases the tube broke off without the welded joint suffering in any appreciable manner.

As regards welding of any description to be done on tubing, we do not advocate the use of tubing made from steel too high in carbon. A low carbon steel gives the better result, and it is also most essential that the phosphorous content of both tube and welding wire shall be low.

Wherever possible, we would suggest that the welding on of hinges and sockets to a main spar or post be avoided. To slot a tube or soften it by welding is unwise, and in place of any fixtures that at present demand such operations we recommend a sweated and pegged fitting.

In support of this some experiments were carried out by our company, in order to convince some of our friends of the advisability of following the course we have suggested. In one case a wiring lug is fixed on a main spar by welding, and in the other by sweating and pegging. Alternating tests on these tubes gave the following results: Welded, 5,190 revs.; soldered, 8,800 revs.

### Tubular Construction Work

A few illustrations of tubular constructional work with which we have had to deal during the last few years will probably be of interest.

We produced, prior to the war, a streamline and tapered strut (seamless). This idea is now being carried further, and we quite expect that these will soon be generally adopted in lieu of wood.

A large trussed girder was designed by us for use in experimental airship planes. This girder weighed (complete, as shown) 4½ lbs., and a load of 5 cwt. at the centre of the 8 ft. span produced a deflection of only ¼ in. A similar girder, weighing 5½ lbs. with a depth of 7½ ins., buckled and collapsed at a total load in the centre of the beam of 10 cwt., equal to one ton distributed evenly. The distance between supports was 8 ft. 6 ins.

### Rust Prevention

One further point remains to be mentioned. It is well known that a long life for any modern aeroplane is not expected. The present necessary wastage in aircraft is such that the question of internal rust and corrosion of the steel work is not of serious moment. The time is coming, however, when such matters will have to be seriously considered. For any post-war machines—especially if designed for general passenger traffic—the question of the length of life of all parts will be one of primary importance. Many experiments have been carried out in this country with this end in view, but nothing definite has been reached.

We have experimented with two or three methods of preserving from rust and corrosion, with fairly satisfactory results, and in the case of airship frame-work, subject as it is to salt-water influence, we have used with fair success the "cosletising" process.

For soldered works, such as rudder and fin frames, we have instituted at our works a thorough system of washing and brushing in hot soda water to remove all traces of the fluxite or the flux, and we think this is most essential.

In conclusion, we would say that "the last word" in tubes and tubular structures has not by any means yet been spoken. With the increase in the size of machines, the constant and ever-increasing shortage of seasoned timber, the extended use of machines in future years in hot climates, with all the climatic effects on timber, the "all-steel" machine will undoubtedly soon become a reality and a necessity, and consequently the subject of tubes and tubular construction assumes increasing importance. We all have much to learn on this subject, and we trust that this paper will prove of mutual benefit, and help forward in some way the science of aeronautics and the good of the community at large.

### A Chance for Boys at the R.A.E.

AN examination for the entry of Trade Lads (Apprentices) in the Royal Aircraft Establishment will be held at Farnborough in December. Applications for admission to the examination must be made on the proper form before Saturday, November 16th. The regulations governing the entry and training of the lads and the necessary forms can be obtained on application, either by post or personally, from the Superintendent, Royal Aircraft Establishment, South Farnborough, who will also be glad to give any information.

### American A.I.D. Methods

SOME little time ago we noted the fact that orders had been issued in the United States to the effect that Government inspectors who passed machines as ready and safe for flight were to accompany the pilot on the first test flight, and we now learn that the same rule applies to mechanics engaged on the repair of machines. They will be required to take a trip aloft after they have pronounced the repair satisfactory. The plan, according to the Director of Aircraft Production, is to give inspectors and mechanics a proper appreciation of their responsibility.

# THE ROYAL AIR FORCE

London Gazette, October 22nd.

The following temporary appointments are made at the Air Ministry:—  
*Staff Officer, 2nd Class.*—Lieut. (Temp. Capt.) H. Atkins, and to be Temp. Maj. while so employed; Oct. 8th.

*Staff Officer, 3rd Class.*—Lieut. (Temp. Capt.) F. M. Iredale, and to retain his temp. rank while so employed; Oct. 14th.

The following temporary appointments are made:—  
*Staff Officers, 1st Class.*—Maj. (Temp. Lieut.-Col.) C. E. Maude, and to retain his temp. rank while so employed; Capt. (Temp. Lieut.-Col.) O. A. Butcher, D.S.O., and to retain his temp. rank while so employed; June 10th. Lieut.-Col. T. W. C. Carthew, D.S.O.; Sept. 24th.

*Staff Officers, 2nd Class.*—And to be Temp. Maj. while so employed:—Capt. C. B. Krabbe; June 29th (substituted for notification in Gazette, Sept. 10th). Capt. K. T. Dowling; Aug. 26th. Capt. A. McR. Moffatt, vice Capt. (Temp. Maj.) Rt. Hon. Sir J. A. Simon, K.C.V.O.; Oct. 5th.

*Staff Officers, 3rd Class.*—And to be Temp. Capt. while so employed, if not already holding that rank:—Capt. G. Aste, Sec. Lieut. A. E. Cripps, Lieut. (Hon. Capt.) L. Pell-Ilderton; Sept. 9th. Lieut. A. Cunningham-Reid, vice Capt. (Hon. Maj.) H. R. P. Reynolds; Oct. 2nd. Capt. E. N. E. Waldron; Oct. 17th.

*Staff Officers, 4th Class (2nd Grade).*—And to be Temp. Lieuts. while so employed:—Sec. Lieut. S. J. Dodson; Sept. 20th. Sec. Lieut. A. Gauld; Oct. 7th.

## Flying Branch.

Maj. H. Wyllie to be Temp. Lieut.-Col. while employed as Lieut.-Col. (A.); Oct. 3rd.

Cpts. to be Temp. Maj. while employed as Maj. (A.):—C. W. Hyde; Sept. 1st. D. F. Stevenson, D.S.O., M.C.; Sept. 10th. H. Colmore; Oct. 2nd. J. F. Gordon, D.F.C.; Oct. 4th. C. O. Fairbairn, C. B. Dalison; Oct. 12th.

Cpts. to be Temp. Maj. while employed as Maj. (K.B.):—Hon. Maj. J. H. Davis; July 12th. M. H. Spencer; Sept. 13th. O. M. Ayrton; Sept. 18th.

Lieuts. to be Temp. Cpts. while employed as Cpts. (A.):—(Hon. Capt.) G. E. Wildman-Lushington; Aug. 8th. S. G. Wingfield, H. W. Elliott, S. A. H. Bowyer, R. W. Anderson, G. P. Alexander, D. Sutherland, C. D. Skinner, E. A. Means (Hon. Capt.) A. F. Horder, J. W. L. Birkbeck, H. Sutherland, W. A. G. Young, J. B. Henry, W. F. Hellyer, I. Gregory, H. A. F. Goodison, G. E. Brooks, N. C. Buckton; Oct. 1st. F. W. Gillett; Oct. 14th. F. C. Crumney; Oct. 15th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.):—H. P. Dalwood; June 30th. J. P. Grieve, A. A. Eales; Aug. 3rd. R. J. Palmer, C. F. Sutton, A. B. Broom; Aug. 31st. T. W. N. Hite; Sept. 15th. W. Pollock, L. M. Robinson, J. G. Rodwell, L. S. Stuart, R. C. Tidbury, L. F. Toucher, F. R. Yelland, A. H. R. Youngleson, F. V. Raleigh; Oct. 12th.

The following Sec. Lieuts. are antedated in their appointments as Sec. Lieuts. (A. and S.), with effect from the dates stated:—R. F. Ralph; May 5th. E. G. Corey; July 7th. J. Thibaudeau; Aug. 10th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A.):—G. S. Smith; July 19th. G. E. Dowler; Aug. 11th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A.):—G. D. Gosnell; Sept. 27th. W. T. Wrathall, A. M. McKay, G. G. Duddell, A. Betterley, J. G. Pearson, E. J. Atherton, J. E. Fox; Sept. 28th. E. G. Carter; Oct. 4th. J. W. Brown; Oct. 5th. R. A. B. Warrilow, J. Briscoe, P. A. Miller, T. P. Forrester; Oct. 8th. W. A. Robertson, G. H. Steels; Oct. 9th.

The following are granted temp. commns. as Sec. Lieuts. (A.):—W. S. McLean (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; H. J. Armitage (Temp. Sec. Lieut., D. of Corn. L.I.); Sept. 24th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (Obs. Officers):—H. D. H. Williams; June 21st. F. Brown; Sept. 30th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—W. Tunstall; June 1st. W. Kennedy, R. Latham, S. Richards, T. James, S. R. Darke, L. R. Shaw, D. Smith, E. T. Jones, E. A. Mann, J. B. Weir, S. Wells; Oct. 14th. W. T. Annan, F. J. Bell, C. E. Fry, H. H. Hand, S. J. Wines, H. E. Sheffield, S. A. Church, A. J. Stewart, J. S. Winks, H. Cavill, F. C. Mildenhall, W. D. Wicks; Oct. 15th. G. H. Tyler; Oct. 16th. A. E. Huffer, R. G. T. Giddens, J. S. D. Taylor, T. J. W. McFadden, S. M. Anderson, H. C. R. Holden, G. F. Gander; Oct. 17th. B. E. Woolstencroft, A. F. Quittenden, D. M. Brown, H. C. Tombs, J. A. G. Williams, T. P. Knott, A. G. Holder, R. Rigby, D. B. Derbyshire, A. Westall, J. Tibbatts, A. R. Culley, C. W. Gill, G. W. Wood, W. H. Gardner; Oct. 19th. W. Norris, F. H. White; Oct. 20th. R. A. P. Hales, S. J. Bassett, W. Richards; Oct. 21st.

The following are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—R. O. Clark (Temp. Sec. Lieut., attd. R. Suss. R.); Sept. 26th. G. Caiger-Watson, M.C. (Lieut., R. Ir. Fus.), and to be Hon. Lieut.; Sept. 28th. I. K. Gillespie (Sec. Lieut., Army Cyclist Corps, T.F.); Oct. 17th. E. G. Kelly (Temp. Sec. Lieut., R. Dub. Fus.), C. A. Overbury (Sec. Lieut., Lond. R., T.F.); Oct. 21st. T. M. Cornish (Sec. Lieut., Oxf. and Bucks L.I., S.R.), D. M. Thomas (Temp. Sec. Lieut., A.S.C.), C. McWilliams (Sec. Lieut., Gord. Highrs., T.F.).

Sec. Lieut. (Hon. Capt.) Hon. R. W. Morgan-Grenville (Capt., Rif. Brig.) relinquishes his commn. on ceasing to be employed; Sept. 28th.

Lieut. W. R. F. Gillham (Lieut., R.A.) relinquishes his commn. on account of ill-health contracted on active service; Oct. 9th. (Substituted for notification in Gazette Oct. 8th).

Lieut. W. R. Swart relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut.; Oct. 23rd.

Lieut. E. R. Varley, M.C., relinquishes his commn. on account of ill-health caused by wounds, and is granted the hon. rank of Lieut.; Oct. 23rd.

Lieut. F. L. Craig-Kelly (Lieut., R.W. Kent R., S.R.), relinquishes his commn. on account of ill-health caused by wounds; Oct. 23rd.

The following Lieuts. resign their commns. to resume medical studies, and are granted the hon. rank of Lieut.:—N. C. Simpson, J. H. Johnson; Oct. 23rd.

Lieut. E. Collis relinquishes his commn., being physically unsuited for the duties of Pilot or Observer; Oct. 23rd.

Lieut. E. W. Turner resigns his commn., being physically unsuited for the duties of Pilot or Observer; Oct. 23rd.

Lieut. E. K. Green resigns his commn., and is granted the hon. rank of Lieut.; Oct. 23rd.

Lieut. H. A. McEwan resigns his commn.; Oct. 23rd.

Sec. Lieut. V. S. Grigg resigns his commn. to resume medical studies, and is granted the hon. rank of Sec. Lieut.; Oct. 23rd.

The following Sec. Lieuts. relinquish their commns., being physically unsuited for the duties of pilots or observers:—S. G. Groom, F. W. B. Bradshaw, A. McCallum, P. E. Beadle, L. C. Page, E. G. Brant, R. S. Percival, W. G. MacCormack, H. J. Sinclair; Oct. 23rd.

## Administrative Branch.

Capt. (Temp. Maj.) H. R. Bently to be Temp. Lieut.-Col. whilst employed as Lieut.-Col.; Oct. 1st.

The following Cpts. are antedated in their appointments to April 1st:—M. B. O'Brien, S. S. Macaskie.

Lieuts. to be Temp. Cpts. while employed as Cpts.:—H. L. Woolveridge; June 1st. C. H. Stonham, from (A.); Sept. 9th. L. G. Hall, from (O.), D. E. B. K. Shipwright, from (A.); Oct. 5th. T. J. Legate; Oct. 9th. H. D. Duncan, from (O.); Oct. 11th.

Lieuts. to be Lieuts.:—A. G. Hearnden, from (O.); Sept. 5th. A. L. C. Hartland-Rowe, from (A.); Sept. 18th. T. C. Morgan, from (K.B.); Sept. 30th. Lord G. H. Foley, from (A.); Oct. 12th. L. A. Christian, from (O.); Oct. 19th.

Sec. Lieuts. to be Lieuts. while employed as Lieuts.:—E. G. Burden; Sept. 23rd. I. Wardle; Oct. 14th.

The following are granted temp. commns. as Lieuts.:—W. W. Popperwell; April 5th. A. S. Batchelor (Temp. Lieut., D. of Corn. L.I.); Sept. 4th. D. B. Collison-Cox (Lieut., N. Staff. R.); Sept. 19th. L. H. B. Price, M.C. (Lieut., R.W. Fus., T.F.); Sept. 23rd. G. W. S. Dundas (Temp. Capt., attd. Rif. Brig.), and to be Hon. Capt.; Oct. 3rd. C. R. R. Gidney (Lieut., attd. K.R.R.C.); Oct. 8th.

Sec. Lieut. F. H. Barratt (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut.; April 1st.

E. Bell is granted a temp. commn. as Sec. Lieut., and to be Temp. Lieut. while specially employed; Oct. 4th.

The following are granted temp. commns. as Sec. Lieuts.:—C. T. H. Page (Temp. Sec. Lieut., Suff. R., S.R.); June 3rd. H. F. Griffiths; Oct. 16th. F. Williams; Oct. 17th. A. C. Jessop, C. J. Eastaugh, A. E. Webb, T. L. Booth, L. G. D. Caines, G. Burrows, H. E. Young, A. L. Kent, D. McCulloch, J. G. Webster, A. H. Wharrier, W. Odam, W. A. Haw; Oct. 21st.

The following relinquish their commns. on ceasing to be employed:—Capt. G. L. Davidson, D.S.C. (Lieut., R.N.); Sept. 25th. Capt. C. Banyard (Lieut., R.N.); Oct. 1st.

Capt. H. F. Mills relinquishes his commn. on account of ill-health, and is granted hon. rank of Capt.; Oct. 23rd.

The following Sec. Lieuts. relinquish their commns. on account of ill-health and are granted the hon. rank of Sec. Lieut.:—A. G. Rogers, L. A. W. Webb, H. Cornford, A. W. Metge, V. S. Monsell; Oct. 23rd.

Sec. Lieut. H. A. P. Coleman resigns his commn., being physically unsuited for the duties of pilot or observer; Oct. 23rd.

## Technical Branch.

Maj. S. S. Nevill to be Temp. Lieut.-Col. whilst employed as Lieut.-Col.; Sept. 1st.

Cpts. to be Temp. Maj. whilst employed as Maj.:—(Temp. Lieut.-Col.) H. B. T. Childs, and relinquishes the temp. rank of Lieut.-Col.; May 22nd. F. W. Mansell; June 5th. H. L. Rutty; Sept. 7th.

To be Temp. Cpts. whilst employed as Cpts.:—Sec. Lieut. (Temp. Lieut.) R. J. Paton; Oct. 1st. Lieut. F. Susans, Sec. Lieut. C. F. Chinery; Oct. 9th.

Lieut. (Temp. Capt.) R. C. Kean to retain the temp. rank of Capt. whilst employed as Capt., from (A.); Sept. 24th.

Lieut. (Temp. Capt.) G. B. Neale reverts to Lieut., and relinquishes the temp. rank of Capt.; Sept. 23rd.

Sec. Lieuts. to be Temp. Lieuts. whilst employed as Lieuts.:—(Hon. Lieut.) A. J. MacNab; June 25th. R. J. Paton; Aug. 9th. (Hon. Capt.) R. J. Wallace; Sept. 1st. E. E. Crook, A. H. Harrison, B. Cheeseman, J. F. Arnitt; Oct. 9th.

The initials of Lieut. H. W. G. Drummond, Brit. Col. Regt., C.E.F., are as now stated and not as in Gazette Sept. 27th.

Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts.:—B. W. King; Aug. 9th. H. N. McL. Roberts; Sept. 17th. A. E. Davies; Sept. 26th.

Sec. Lieuts. (Admin.) to be Sec. Lieuts.:—A. S. Crosby; July 1st. S. F. Blanck; Aug. 10th. H. A. Parsons; Aug. 22nd. H. L. Jones; Sept. 6th. E. G. Davidson; Sept. 8th. L. Henri, E. B. Addison, C. F. P. Davies, W. S. Stejles; Sept. 21st. W. H. Johnson, R. C. Bookless, R. H. Clarke; Sept. 26th. H. H. Peppercorn; Sept. 28th. C. J. Beardow; Sept. 30th. E. E. Blake; Oct. 1st. R. G. B. Blanchard; Oct. 2nd. T. Mitchell; Oct. 7th.

The following are granted temp. commns. as Sec. Lieuts.:—R. G. Campbell (Lieut., R.F.A., S.R.), and to be Hon. Lieut., K. Mines (Temp. Sec. Lieut., R.E.); Sept. 21st.

W. Randall (Lieut., Middx. R.), and to be Hon. Lieut.; Sept. 28th.

Lieut. J. B. Saer to be Lieut., from (Admin.); Sept. 28th.

Lieuts. (A.) to be Lieuts.:—G. E. F. Elliott; Sept. 19th. C. M. Kelly; Oct. 7th.

Sec. Lieut. A. C. Smith (commnd. Shipwright, R.N.) relinquishes his commn. on ceasing to be employed; Sept. 23rd.

Sec. Lieut. V. H. Appleyard relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut.; Oct. 23rd.

## Medical Branch.

Lieut. F. H. Wallace to be Capt.; Oct. 1st.

Admin. (Med.)—Lieut. G. G. Coury, V.C., to be Temp. Capt. while employed as Capt.; Sept. 30th.

## Memoranda.

Lieut.-Col. (Temp. Brig.-Genl.) F. L. Festing, C.M.G., to be Col., and to retain his temp. rank; Oct. 14th.

Capt. J. Andrews (late R.N.A.S., Oct. 1st, 1915) relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Capt.; Oct. 23rd.

E. Duven (late Lieut., Hon. Capt.) is granted the hon. rank of Capt.; June 11th.

London Gazette, October 25th.

The following temp. appointments are made at the Air Ministry:—  
*Staff Officer, 1st Class.*—Lieut.-Col. C. R. Finch-Noyes, D.S.O.; Sept. 10th.

*Staff Officers, 2nd Class.*—And to be Temp. Maj. whilst so employed:—(T.) W. A. Legg (Temp. Capt., R.E.), and is granted a temp. commn. as Capt., Capt. R. H. Parkinson; April 1st. (Q.) Capt. J. Rylands; Oct. 1st.

*Staff Officers, 3rd Class.*—And to be Temp. Cpts. whilst so employed, if not already holding that rank:—Lieut. (Hon. Capt.) W. T. Taylor (date of first commn. Sept. 30th, 1915); June 12th. (T.) Sec. Lieut. (Temp.



Capt.) H. F. L. Dixon; July 1st. R. H. H. Watson (Temp. Lieut., R.E.), and is granted a temp. commn. as Lieut.; Sept. 2nd.

The following temporary appointments are made:—

**Staff Officers, 2nd Class.**—And to be Temp. Maj. whilst so employed, if not already holding that rank:—Capt. G. K. Macdonald, vice Capt. (Temp. Maj.) C. C. Darley, who relinquishes the temp. rank of Maj.; Oct. 8th. (P.) Capt. (Temp. Maj.) E. W. Forbes, M.C., vice Capt. (Temp. Maj.) R. L. Kennedy, who relinquishes the temp. rank of Maj.; Oct. 11th. (Q.) Capt. (Temp. Maj.) E. H. Cockburn, vice Capt. (Temp. Maj.) A. W. Macilwaine, who relinquishes the temp. rank of Maj.; Oct. 24th.

**Staff Officers, 3rd Class.**—And to be Temp. Capt. whilst so employed, if not already holding that rank:—Lieut. (Temp. Capt.) I. H. P. McEwen; Aug. 23rd. Lieut. R. R. Frecheville; Aug. 24th. Capt. T. E. Withington, vice Capt. G. K. Macdonald; Oct. 8th. (T.) Sec. Lieut. D. C. Sutherland; July 4th.

**Staff Lieut, 2nd Class.**—Capt. S. T. Ravenscroft; May 15th to Sept. 19th.

#### Flying Branch.

Lieuts. to be Temp. Capt. while employed as Capt. (A.):—C. G. H. Wadleigh, M. W. Richardson; Sept. 16th. E. A. Simson; Oct. 1st. H. J. Miles, G. Milner; Oct. 4th. E. J. Stephens; Oct. 6th. E. L. Bishop, M.C., H. J. Duncan, M.C., E. Mycock; Oct. 8th. F. C. U. Dymant; Oct. 9th. S. W. Cowper-Coles; Oct. 12th. G. W. T. Glasson; Oct. 15th.

Sec. Lieut. J. H. Sprott to be Temp. Capt. while employed as Capt. (A.); Oct. 2nd.

Cpts. to be graded for purposes of pay as Cpts. (A. and S.) while so employed:—C. H. Fitzherbert, R. R. Soar; Oct. 1st.

Lieut. R. B. Gibb to be Temp. Capt. while employed as Capt. (Dir.); Oct. 17th.

Lieut. J. M. McCleery to be Temp. Capt. while employed as Capt. (S.); Oct. 8th.

Lieuts. to be Lieuts. (A.) from (Obs. Officers):—E. S. Jacobs; Sept. 8th. E. R. Stranger; Sept. 12th. F. R. D. Wickham; Sept. 24th. W. A. Duncan, W. D. Vernon; Sept. 27th. L. C. Diespecker, M.C.; Sept. 28th. W. J. Walsh; Sept. 29th. H. K. Thompson, H. G. P. Ovenden, C. L. Silvester, R. T. Shepherd, E. M. Slatter; Sept. 30th. K. E. Ward; Oct. 1st.

Lieut. C. A. McConchie to be Lieut. (Dir.) from Obs. Officer; Sept. 5th. (Substituted for notification in *Gazette* Oct. 1st).

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their ranks as Sec. Lieuts. (A.):—C. O. Smith; Sept. 3rd. H. C. Traver; Sept. 12th. G. W. Porter, A. Popini; Sept. 16th. W. H. S. Gee; Sept. 25th. L. Hollingsworth, F. A. Douglas, E. Head, J. E. Phelps; Sept. 27th. C. V. Wood, A. E. H. Sinclair, F. C. W. Toone, F. James, L. S. Clarke, A. G. Cunningham, A. Harman; Sept. 28th. W. R. Bannister, E. E. Fresson, C. C. S. Preston, J. P. Skredlant, W. Drage, F. H. Thirkell, J. A. Spark, J. Huson, R. N. Webster, H. H. Smith; Sept. 29th. G. Jennings, J. E. Taylor, H. P. Johnston, J. C. Holdsworth, F. V. Riley, E. A. Pudney, S. T. Goodnoh, G. P. Kells, H. J. Cramphorn, S. A. Slater, C. F. Baumhofer, R. L. Brown, A. T. Start, D. Miller, F. L. Smith, R. Smith, A. Lawlor, S. P. F. D. R. Rust, L. H. Howard, F. Stringer, A. Martin, C. L. Wilson, G. R. Hodgkinson, G. W. Harvey, E. K. Dashwood, G. D. Stewart, F. H. Simon, W. Redmond; Sept. 30th. H. I. Nicholl, R. H. Fotheringham, J. L. Boyd, F. Dixon, L. W. Seaby; Oct. 1st. H. L. Howel; Oct. 2nd. J. V. Flanagan; Oct. 3rd.

The following Prob. Flight Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (A.):—R. P. Dennistoun; July 21st. R. S. Auden, C. St. A. Begg, F. L. Southgate, P. F. A. Curtis; Sept. 27th. W. Y. Gothorp, R. H. Ash; Sept. 28th. J. N. Dean, E. L. Evans, J. A. Tyacke, E. W. Berry; Sept. 29th. A. P. Besley, F. W. A. Dawkins, E. J. Whitwell; Sept. 30th.

The following are granted temp. commns. as Sec. Lieuts. (A.):—G. H. Bisailon (Lieut., Can. Fors. Corps), and to be Hon. Lieut.; Sept. 24th. F. Lloyd (Sec. Lieut., Worc. R., S.R.), C. Kipling (Temp. Sec. Lieut., Middx. R.), J. W. Hawley (Sec. Lieut., Yorks. L.I., T.F.), C. N. Yeoman (Temp. Sec. Lieut., S. W. Bord. R.), P. C. Hoyle (Lieut., R.F.A., S.R.), and to be Hon. Lieut., R. M. C. Smith (Temp. Sec. Lieut., Rif. Brig.); Sept. 27th. S. S. Owen (Lieut., Columbia R., C.E.F.), and to be Hon. Lieut., T. St. J. H. Silvester (Sec. Lieut., Ches. R., S.R.), A. R. Turner (Sec. Lieut., York and Lanc. R., S.R.), W. E. Gandell (Temp. Sec. Lieut., Essex R.), S. W. Taylor (Temp. Lieut., E. Surr. R.), and to be Hon. Lieut., P. E. Thomas (Temp. Sec. Lieut., North'n. R.); Sept. 28th. J. P. Stewart-Burton (Sec. Lieut., Devon R.), W. I. L. Legg (Sec. Lieut., K. L'pool R., T.F.); Sept. 29th. H. W. Frith (Lieut., Camb. R., T.F.), and to be Hon. Lieut., W. W. Baker (Temp. Sec. Lieut., Hamp. R.), R. D. King (Lieut., R. Fus., T.F.), and to be Hon. Lieut., H. B. Wood (Lieut., R.F.A.), and to be Hon. Lieut., N. J. Watson (Lieut., K.R.R.C., S.R.), and to be Hon. Lieut., C. A. Morris (Sec. Lieut., K. L'pool R., T.F.), W. A. Scarlett (Sec. Lieut., R. W. Kent, T.F.), H. G. Little (Temp. Sec. Lieut., S. African Arty.), M. H. Tisdall (Lieut., Som. L.I.), and to be Hon. Lieut., J. A. Stewart (Temp. Sec. Lieut., High. L.I.), R. G. Wilson (Sec. Lieut., Lancs. Fus., T.F.), W. McKay (Lieut., E. Ontario R., C.E.F.), and to be Hon. Lieut., A. H. Lumsden (Temp. Sec. Lieut., Oxf. and Bucks. L.I.), F. J. Bodenham (Temp. Sec. Lieut., Leins. R.), R. H. Whittaker (Lieut., C. Ont. R., C.E.F.), and to be Hon. Lieut.; Sept. 30th. J. Milton (Temp. Sec. Lieut., D. of Corn. L.I.), J. W. Patterson (Sec. Lieut., K. L'pool R., T.F.), H. T. Burt (Sec. Lieut., R.F.A., S.R.), W. P. Jolly (Temp. Sec. Lieut., attd. Rif. Brig.); Oct. 1st. J. H. B. Rygate (Sec. Lieut., Dragon Gds.); Oct. 2nd. H. C. Hawkins (Sec. Lieut., R.F.A., S.R.); Oct. 3rd. G. I. Packman; Oct. 22nd.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A.):—A. J. Fraser, L. C. Wilcocks, E. S. McNames, E. G. Peter; Oct. 9th. G. O. Thompson; Oct. 10th. S. E. Wood, J. E. S. Dunham, A. F. B. Brodbeck, R. W. Cawston, C. J. Green; Oct. 11th. L. F. Cubitt, R. B. J. Daville; Oct. 12th. A. E. Newall; Oct. 13th. S. V. Pearce, J. A. Shipton; Oct. 14th. J. C. Carson; Oct. 15th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.):—P. D. Anderson, H. C. W. Weston, A. J. Wilson, B. H. Wooler; July 6th. C. R. E. Wakefield; July 22nd. B. H. Henwood; Aug. 17th. E. A. Thompson, J. P. Bernadie; Aug. 31st. R. H. Rosenthal; Sept. 7th. A. P. Leslie; Oct. 14th.

J. Edwards, M.C. (Temp. Lieut., attd. Welsh R.), is granted a temp. commn. as Sec. Lieut. (K.B.), and to be Hon. Lieut.; May 10th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (K.B.):—J. R. Jones; Sept. 24th. E. E. James; Oct. 15th. V. A. Eyles, W. Turner; Oct. 17th.

G. W. Mitchell (Sec. Lieut., E. York. R., T.F.) is granted a temp. commn. as Sec. Lieut. (Obs. Officer); Aug. 16th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—

W. H. Taylor, S. G. Squires, E. N. Andrews, J. E. Prosser; Sept. 28th. W. H. Welsh, T. A. Scowcroft, J. T. R. Wynn; Oct. 1st. R. A. G. Beschenkowsky, W. Hopkins, F. G. Rossiter, H. Town, E. May; Oct. 11th. W. S. McDonald, F. D. R. McLaren, W. L. Minter, P. G. Horlington; Oct. 14th. A. L. B. Rees, E. St. M. C. Weinman; Oct. 19th. W. J. B. Penman; Oct. 20th. R. D. Court, A. R. M. Gunning, R. Roberts, T. Townson, F. R. James, G. W. Minto, G. Boyer; Oct. 23rd.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (S.):—G. A. Hood; Oct. 1st. E. C. Collymore; Oct. 3rd.

The following Prob. Flight Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (S.):—S. J. Smetham, R. G. Spencer; Oct. 2nd.

The following relinquish their commns. on ceasing to be employed:—Lieut. S. W. Mills (Lieut., R.F.A., T.F.); Sept. 23rd. Lieut. H. McKenzie; Sept. 30th. Sec. Lieut. F. L. Peplow; Oct. 26th.

Maj. M. McB. Bell Irving, D.S.O., M.C., relinquishes his commn. on account of ill health caused by wounds, and is granted the hon. rank of Maj.; Oct. 26th.

Lieut. (Hon. Capt.) M. W. H. Evans resigns his commn. in order to resume his medical studies, and is granted the hon. rank of Capt.; June 26th.

Lieut. (Hon. Capt.) R. Corbett (Capt., W. Som. Yeo., T.F.) relinquishes his commn. on account of ill health caused by wounds; Oct. 26th.

Lieut. W. F. Robinson resigns his commn. in order to resume his medical studies, and is granted the hon. rank of Lieut.; Oct. 26th.

The following Lieuts. relinquish their commns. on account of ill health contracted on active service, and are granted the hon. rank of Lieut.: R. F. P. Abbott, J. Fleming; Oct. 26th.

Lieut. R. H. Lloyd relinquishes his commn. on account of ill health caused by wounds and is granted the hon. rank of Lieut.; Oct. 26th.

Lieut. W. J. Walker relinquishes his commn. on account of ill health, and is granted the hon. rank of Lieut.; Oct. 26th.

Lieut. W. J. E. Griffiths (Can. F.A.) relinquishes his commn. on account of ill health, contracted on active service; Oct. 26th.

Lieut. A. H. Santa Maria resigns his commn., and is granted the hon. rank of Lieut.; Oct. 26th.

Sec. Lieut. H. W. Leyland relinquishes his commn. on account of ill health, and is granted the hon. rank of Sec. Lieut.; Oct. 26th.

The following Sec. Lieuts. relinquish their commns., having been found physically unsuited for the duties of pilots or observers:—A. H. Bliss, A. C. S. Hawkins, A. E. Turfery; Oct. 26th.

The date of appointment of Sec. Lieut. C. C. Worboys is antedated to July 6th.

The dates of appointment as Sec. Lieuts. (A. and S.) are antedated as stated against their names:—

C. S. Gregg; April 12th. T. Whitman; May 1st. A. J. F. Ross; Aug. 18th.

The initials of Sec. Lieut. F. G. Coulson are as now described, and not as stated in the *Gazette* of Oct. 11th.

The notification in *Gazette* July 2nd concerning Lieut. C. R. O'Hagan is cancelled.

The notification in *Gazette* Oct. 1st concerning Sec. Lieut. T. A. Evans is cancelled.

The notification in *Gazette* Sept. 17th. concerning Sec. Lieut. W. B. Day is cancelled.

The notification in *Gazette* of Aug. 20th concerning Sec. Lieut. C. H. Moss is cancelled.

The notification in *Gazette* Oct. 1st concerning Sec. Lieut. F. C. Dixon, Manch. R., is cancelled.

The notification in *Gazette* Sept. 24th concerning Sec. Lieut. J. C. Stone is cancelled.

The notification in *Gazette* Sept. 10th concerning Sec. Lieut. B. E. Taylor is cancelled.

The notification in *Gazette* July 30th concerning P.F.O. J. E. Greenwell is cancelled.

The notification in *Gazette* July 16th concerning Lieut. J. E. Edwards, M.C., Welsh R., is cancelled.

The notification in *Gazette* July 30th concerning P.F.O. S. E. Whitley is cancelled.

The notification in *Gazette* June 11th concerning P.F.O. E. M. Ackery is cancelled.

The notification in *Gazette* Sept. 20th concerning Sec. Lieut. J. Hart is cancelled (substituted for notification in *Gazette* Oct. 11th).

The initials of G. Chillingworth are as now described, and not as in *Gazette* Sept. 6th.

The surname of A. L. Fachnie is as now described, and not as in *Gazette* Sept. 17th.

The surname of R. Reid Thomson is as now described, and not as in *Gazette* Sept. 6th.

The surname of L. H. McHarg is as now described, and not as in *Gazette* Sept. 6th.

The surname of James Henry Sprackling is as now described, and not as in *Gazette* Sept. 13th.

#### Administrative Branch.

Maj. L. P. Walker to be Maj., from (T.); Oct. 14th.

Cpts. to be Temp. Maj. whilst employed as Maj. :—E. E. R. Heathcote; Oct. 7th. J. Fowler; Oct. 14th.

Capt. S. T. Ravenscroft to be Capt., from (S.O.); Sept. 20th.

Capt. A. H. W. Wall, M.C., to be Capt., from (T.); Sept. 30th.

The following are granted temp. commns as Cpts.:—G. S. Ridgway (Lieut., R.N.); June 20th. A. A. Gawn (Hon. Capt., A.P.D., ret. pay); Oct. 25th.

Lieuts. to be Temp. Capt. whilst employed as Cpts.:—(Hon. Capt.) J. W. Higgins, A. McIntosh; April 1st. (Hon. Capt.) L. V. Popkiss; July 9th.

F. E. Hobley; Sept. 1st. (Hon. Capt.) C. H. Lewis; Sept. 13th. H. C. Griffith; Oct. 4th.

Sec. Lieut. (Temp. Lieut.) H. W. Prockter to be Temp. Capt. whilst employed as Capt.; June 30th.

Lieuts. (A.) to be Lieuts.:—J. U. G. Lamond; Aug. 1st. T. M. Jones; Sept. 27th. E. G. Taylor; Oct. 2nd. H. L. Northey; Oct. 12th. E. R. Rudling; Oct. 19th.

Lieuts. to be Lieuts.:—H. F. L. Codner, from (Dir.); Oct. 9th. W. O. Hatcher, from (O.); Oct. 14th.

Lieut. (Temp. Capt.) F. C. Staines to be Lieut. on relinquishing appointment and temp. rank of Capt.; Sept. 3rd.

Sec. Lieuts. to be Temp. Lieuts. whilst employed as Lieuts.:—(Hon. Capt.) G. H. Green; May 26th. (Hon. Lieut.) L. Cable; June 1st. N. Openshaw; July 1st. D. Beaumont; Aug. 1st. L. Butterfield; Aug. 12th. (Hon. Lieut.) E. H. Eldridge, J. M. Moore; Sept. 1st. J. S. Archer; Sept. 30th.

J. Freeman Fowler is granted a temp. commn. as Lieut.; April 1st. (Substituted for notification in *Gazette* April 26th).

R. Blackwood (late Lieut., Notts. and Derby. R.), is granted a temp. commn. as Lieut.; Oct. 19th.

The following are granted temp. commns. as Sec. Lieuts. and to be Temp. Lieuts. whilst specially employed:—G. F. Peirson; Sept. 22nd. H. Bradshaw; Oct. 12th. S. A. Snatt (Hon. Maj.) and Or.-Mr., ret. pay) and to be Hon. Maj.; J. W. Rimmer, H. H. Brown, H. C. Haywood-Gibbons, J. L. Green, F. L. Letten, T. H. Nunn, E. P. Pearce, R. W. Rochall, T. Scott, H. H. Stone, H. J. Cutler; Oct. 21st. G. A. Middleweek; Oct. 22nd.

The following are granted temp. commns. as Sec. Lieuts.:—A. E. Ashley, H. Baker, H. P. Bolt, W. J. Britton, M. H. Child, P. F. Cullen, G. H. Ellis, H. S. Gain, E. G. Harris, P. D. Hind, W. M. Limb, J. Randall (Hon. Sec. Lieut., late Serv. Bu., K.R.R. Rif. C.), S. Saunders, M.C. (Hon. Lieut., late R.F.A., T.F.), and to be Hon. Lieut., H. S. Smith, A. W. Spice, J. H. Stone, C. Sugarman, F. H. Swaffer, R. Worton (Temp. Lieut., ret. pay) and to be Hon. Lieut.; Oct. 22nd. P. F. Jessop; Oct. 23rd.

The following Lieuts. relinquish their commns. on ceasing to be employed:



D. MacKenzie (Lieut., Lond. R., T.F.); June 8th. W. G. G. Bittles (Temp. Payr., R.N.R.); Oct. 10th.

Lieut. (Temp. Capt.) D. A. Parsons relinquishes the temp. rank of Capt. on ceasing to hold a special appointment at the Ministry of Munitions; Oct. 3rd.

Capt. J. Gibson (date of commn. Sept. 13th, 1917) relinquishes his commn. on account of ill-health, and is granted the hon. rank of Capt.; Oct. 26th.

Lieut. L. S. Northcote relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Lieut.; Oct. 26th.

Sec. Lieut. A. Spittall relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut.; Oct. 26th.

Sec. Lieut. S. B. Coxon relinquishes his commn. on account of ill-health contracted on active service, and is granted the hon. rank of Sec. Lieut.; Oct. 26th.

The following Sec. Lieuts. resign their commns.:—J. R. Bonnet, J. M. L. Roots; Oct. 26th. The surname of Sec. Lieut. L. B. Goodyer is as now described and not as in *Gazette* July 23rd.

## Technical Branch.

Sec. Lieut. (Temp. Lieut.) H. Norrington to be Temp. Maj. whilst employed as Maj., from (Ad.); Oct. 14th.

Lieuts. to be Temp. Capts., while employed as Capts.:—J. H. Secker; June 1st. H. S. Hewitt; Sept. 1st. E. A. Richards; Oct. 9th. J. Y. de la C. Elliott; Oct. 14th.

Sec. Lieuts. (Temp. Lieuts.) to be Temp. Capts. while employed as Capts.: N. Hemsley, H. M. Rootham; Sept. 1st.

R. H. Parkinson (Capt., R.E., T.F.) is granted a temp. commn. as Capt.; April 1st.

E. E. Pash (Temp. Sec. Lieut., R.E.) is granted a temp. commn. as Lieut.; Sept. 5th.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts.:—W. Calvert; June 17th. H. J. Lewis; July 1st. (Hon. Lieut.) D. L. Hollis; Aug. 1st. F. P. Lambert; Aug. 5th. P. G. Edmonds, S. J. Fountain, W. St. J. Littlewood, H. W. Mason, (Hon. Lieut.) A. D. Napier, G. J. H. Stein, D. L. Stewart, D. Warnford-Davis; Sept. 1st. E. J. Williams; Sept. 30th. E. W. Chatterley; Oct. 2nd.

P. S. Reed (Sub-Lieut., R.N.V.R.) is granted a temp. commn. as Sec. Lieut., and to be Hon. Lieut.; April 1st (substituted for notification in *Gazette*, June 25th).

The following are granted temp. commns. as Sec. Lieuts.:—R. S. Broderick; Oct. 10th. B. A. Clinging, W. Matthew; Oct. 22nd.

The initials of Capt. (Temp. Maj.) O. C. Williams are as now described, and not as in *Gazette* Oct. 15th.

The notification in *Gazette* Sept. 10th concerning Temp. Lieut.-Col. Lord A. R. Innes-Ker, D.S.O., is cancelled.

The notification in *Gazette* Aug. 6th regarding Temp. Sec. Lieut. W. B. Close, R.E., is cancelled.

## Medical Branch.

H. T. H. Butt is granted a temp. commn. as Capt.; Oct. 21st.

## Memoranda.

Col. (Temp. Brig.-Gen.) A. V. Vyvyan, C.B., D.S.O., to be actg. Maj.-Gen. whilst specially employed; Oct. 8th.

Capt. J. W. Aldridge (S.O.3) is granted the hon. rank of Maj.; July 10th. Sec. Lieut. C. A. Luce is granted the hon. rank of Lieut.; Aug. 21st.

Lieut.-Col. C. H. Meares relinquishes the appointment of S.O., 1st Class; Oct. 19th.

Lieut. (Temp. Capt.) W. S. de Ropp relinquishes the appointment of S.O., 3rd Class, and the temp. rank of Capt.; Sept. 21st.

Capt. J. C. Hanbury-Williams, (Lt., Hus., S.R.) relinquishes his commn. on ceasing to be employed; Oct. 23rd.

Capt. (Temp. Maj.) Sir J. A. Simon, K.C., K.C.V.O., resigns his commn., and is granted the hon. rank of Maj.; Oct. 26th.

## Royal Flying Corps (Military Wing).

### London Gazette Supplement, October 22nd.

Flying Officer (Obs.) Temp. Lieut. H. G. Frost, attd. Suff. R., and to be transferred to R.F.C. (Gen. List); March 31st, 1916.

### London Gazette Supplement, October 24th.

Sqdn. Comd. Lieut. (Temp. Capt.) C. D. Fuller, R. Suss. R., from a Flight Comdr., and to be Temp. Maj. while so employed; Feb. 1st.

### London Gazette Supplement, October 25th.

Flying Officer (Observer).—Temp. Sec. Lieut. T. C. Stewart, attd. Gord. Highrs., and to be transfd. to R.F.C., Gen. List; Sept. 28th, 1917, seniority July 28th, 1917. The notification in *Gazette* of November 17th, 1917, regarding Temp. Sec. T. C. Stuart, attd. Gord. Highrs., is cancelled.

# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION.

### British

#### Headquarters R.A.F., Independent Force, October 22nd.

"On October 21st two squadrons made a successful attack on the barracks and railways at Metz, and, in spite of fog and clouds, all returned safely. Another squadron set out to attack certain factories on the Rhine. When near the objective the formation ran into dense clouds and became split up. At present seven machines are unlocated. During the night of October 21st-22nd a heavy and successful attack was made on the factories at Kaiserslautern. Many heavy bombs were dropped on the important stations at Mézières. All our night-flying machines returned safely."

#### General Headquarters, October 22nd.

"On October 21st, in spite of very unfavourable weather conditions, some reconnaissance work was completed, and over a ton of bombs was dropped on enemy troops and transport. There was very little activity on the part of the enemy's aircraft. In air fighting one hostile machine was shot down and one was driven down out of control. Two of our machines are missing. Owing to the weather conditions, no night operations could be carried out."

#### Headquarters R.A.F., Independent Force, October 23rd.

"On the morning of the 23rd inst. the railways at Metz-Sablon were again subjected to heavy attacks by our squadrons. Many direct hits were obtained on the railway triangle and barracks. In the course of attacks by enemy aeroplanes, one was destroyed and three were driven down out of control. One of our machines is missing."

#### General Headquarters, October 23rd.

"On October 22nd thick mist and clouds continued to curtail our operations, but, in spite of this, a fair amount of reconnaissance and contact patrol work was done, targets were reported to our artillery, and photographs taken. Casualties were inflicted on enemy troops by bombs and machine-gun fire, and direct hits were obtained on a train. A total weight of  $3\frac{1}{2}$  tons of bombs was dropped. There was slight activity on the part of hostile aircraft on the southern battle front, but none was shown elsewhere. In air fighting, one enemy aeroplane was shot down out of control and one balloon was destroyed. A German night-bombing machine, caught in the beams of our searchlights, was shot down in flames by Lewis gunfire from the ground. Three of our machines are at present reported missing. In spite of adverse weather conditions, some of our night-flying machines succeeded in penetrating a long way behind the enemy's lines and in obtaining direct hits on an important railway station and on other centres of activity,  $1\frac{1}{2}$  tons of bombs being dropped. All these machines have returned."

#### Headquarters R.A.F., Independent Force, October 24th.

"On the night of the 23rd-24th our machines carried out heavy and successful attacks on the factories and railways at Burbach and Saarbrücken; over  $5\frac{1}{2}$  tons of bombs were dropped on these two objectives. The chemical factories at Mannheim, the railways at Coblenz and near Mainz, and the railways at Metz-Sablon were also attacked with good results. At present one of our machines has not been located. In addition to the enemy aircraft reported destroyed in yesterday's *communiqué*, one enemy aircraft was destroyed, falling on our side of the lines, and two more were shot down out of control."

#### General Headquarters, October 24th.

"On October 23rd every advantage was taken of a slight improvement in the weather to maintain active co-operation with our attacking troops. Hostile troops and transport were vigorously attacked from the air with bombs and machine-gun fire. A total of nearly 6 tons of bombs was released by us during the day on different targets. The enemy's aircraft were very active over the battle front. Thirteen German machines were shot down and four driven down out of control. One German balloon was shot down in flames. Ten of our machines are missing. On account of weather conditions, no night flying took place."

#### War Office, October 24th.

"Italian Front.—Bad weather has made flying difficult for the last 10 days, and there has been little air fighting. Two enemy balloons have been destroyed without loss to ourselves."

#### Headquarters R.A.F., Independent Force, October 25th.

"The machine previously reported unlocated in the report dated October 24th has now been located."

#### General Headquarters, October 25th.

"On October 24th our squadrons continued their activity along the entire front. Although bad visibility somewhat restricted long-distance operations, many valuable reconnaissances were completed and numerous photographs were taken. Our machines co-operated with our attacking infantry, and continued to harass the enemy with bombs and machine-gun fire. The railway junction at Hirson was heavily attacked. Photographs show that excellent results were obtained, great damage being caused by bombs bursting among quantities of rolling stock. Over  $12\frac{1}{2}$  tons of bombs were dropped. There was only slight activity on the part of the enemy's aircraft. In air fighting, four hostile aeroplanes were shot down and four were driven down out of control. Ten of our machines are missing. There were no night operations on account of weather conditions."

#### War Office, October 25th.

"Archangel.—Allied aeroplanes with Russian pilots were of great assistance in these operations [the repulse of an attack on the Allied position on the River Dvina] and caused a panic among the enemy ships."

"Mesopotamia.—In the operations [on the road to Mosul] our aeroplanes have bombarded Turkish camps and have made numerous attacks on the retreating enemy."

#### General Headquarters, October 26th.

"On October 25th clouds and mist somewhat restricted operations, but our squadrons completed some valuable reconnaissance and contact patrol work. Four and three-quarter tons of bombs were dropped during the day, chiefly on targets in the enemy's forward areas. Hostile aircraft showed little activity. In air fighting three German machines were shot down, and three were driven down out of control. Three of our machines are missing. No night-flying was possible on account of weather conditions."

#### General Headquarters, October 27th.

"On October 26th a great deal of reconnaissance and photographic work was accomplished by our squadrons, and nearly  $8\frac{1}{2}$  tons of bombs were dropped, important railway stations being attacked with excellent results. The enemy's aircraft showed some activity over the northern battle front, and in air fighting eight of his machines were destroyed and three more were driven down out of control. Two enemy balloons were shot down in flames. Nine of our machines are missing."

"In spite of very unfavourable weather conditions, some of our night-flying machines succeeded in dropping over 3 tons of bombs on railway junctions and other targets in the enemy's lines of communications. All these machines have returned."

#### Headquarters R.A.F., Independent Force, October 27th.

"Our machines carried out heavy attacks on Frescaty aerodrome to-day. Bombs were observed to burst well on the target. All our machines returned."

### French

#### Paris, October 22nd.

"On October 21st, in spite of very unfavourable weather, in the western region of the front and in Flanders our observation crews did important reconnoitring and watching work behind the enemy front. Two enemy aeroplanes were brought down and a balloon was set on fire. Taking advantage of a short spell of clear weather at the beginning of the night, our bombers dropped nearly 19 tons of projectiles on big railway junctions, particularly on the stations of Longuyon, Stenay, Hirson, Vervin, Marles, Montcornet, Rosoy-sur-Serre, Prévisy-sur-Serre, and Liart. A large number of direct hits were observed, which caused fires in the stations of Longuyon, Hirson and Rosoy-sur-Serre."

#### Paris, October 23rd.

"On the 22nd the thick mist and rain once more hampered the work of our airmen. Our observation machines, protected by our chaser planes were nevertheless enabled to carry out their usual reconnoitring work in the enemy back areas. During these operations three enemy aeroplanes were brought down and two captive balloons were set on fire."

"During the night, in spite of the mist, which continued to be thick, our bombardiers dropped over 7 tons of projectiles on the railway stations of Liart, Hirson, Provisy, and Le Chesne. Our fire caused a conflagration in Liart station."

#### Paris, October 24th.

"On October 23rd, the weather having improved, our airmen were able to do a considerable amount of work. The observation machines, in the



course of numerous reconnaissances, some of which were pushed to a distance of over 70 kilometres (43 miles) behind the enemy lines, brought back several hundreds of photographs. Two captive balloons were set on fire, and 12 enemy aeroplanes were brought down or put out of action. The majority of these successes were attained in the region of the Aisne, where our chasers were particularly vigilant. During the night our bombers went up in spite of particularly unfavourable atmospheric conditions. They dropped 14,500 kilograms (about 14 tons) of projectiles on the railway stations of Montcornet, Marles, Vervins and Wassigny, and especially on the station of Provsky, where over seven tons of explosives were dropped, causing several fires."

Paris, October 26th.  
"During the 25th, despite dense fog and rain, our air service lent our troops effective support. During the battle on the front of the Fifth Army, while the chaser patrols, flying over the battlefield at a height of from 100 to 200 metres, were assuring the security of the air, our observation machines, flying still lower, were machine-gunning enemy troops, convoys, and batteries supporting the Tank attacks, regulating the fire of our artillery, and marking the advance of the infantry. One machine directed our artillery fire from a height of 120 ft. Another airman carried out, at a height of about 900 ft., a reconnaissance 5 miles behind the enemy's lines, and was able to signal that important German reinforcements were arriving in motor lorries in the region of St. Fargeux. They were at once caught under the fire of our guns."

U.S.A.  
Paris, October 27th.  
"The improvement in the weather has made possible active aerial operations on the front of the First Army. Our pursuit squadron engaged the enemy in many combats, in the course of which 13 enemy aeroplanes and five of our machines were shot down. Our bombing units dropped 3½ tons of explosives on Briquelay."

### The King and Escaped Flying Officers

LIEUTS. J. H. TULLIS, R.F.A. and R.A.F., and C. W. Blain, R.A.F., who have escaped from Germany, were received by the King at Buckingham Palace on Monday. His Majesty had an interesting chat with them as to their experiences in captivity and the circumstances in which they regained their liberty.

### Prince Albert Flies

It was announced in the *Court Circular*, dated Buckingham Palace, October 23rd, that the Prince Albert, attended by Maj. Louis Greig, left the Palace that morning and proceeded by aeroplane to France.

### Back from Germany

LIEUT. C. GEEN, London Regt. and R.F.C., who was a prisoner of war in Germany, has now arrived in England.

### Huns Escape from Denmark

THREE German airmen, who were interned at Odense, Denmark, were reported to have escaped last week, and it is believed that they have succeeded in getting across the frontier into Germany.

### Damage at Hun Aerodrome

THE effectiveness of British bombing raids has been testified to recently by captured prisoners, who, among other things, have disclosed that in a recent raid by a British squadron on the German aerodrome on the Valenciennes-Formars road, over 30 aeroplanes were destroyed, apart from other serious damage.

### Air Supremacy and Air Routes

AMONG the subjects discussed at the conferences last

### Italian

Rome, October 23rd.  
"Our airmen effectively bombarded trains and hutments in the railway station of Casarsa and various military objectives in the back areas of the Asiago Plateau. One machine dropped 300 kilogrammes of bombs on the arsenal of Pola. Two hostile planes and a captive balloon were brought down in air fighting; a third machine, hit by anti-aircraft batteries, came down in flames."

"Despite bad weather conditions in . . . maritime coast traffic was efficiently protected by naval aviation which also supplied useful information regarding enemy positions and movements both by land and sea. An enemy submarine was successfully bombarded at low altitude and is considered sunk. Torpedo craft flotillas carried out effective counter battery work with the coast batteries of San Giovanni di Medua yesterday, machine-gun positions being also bombarded. Lieut. Ruggeri, commanding one of the units engaged entered the port with great daring and torpedoed an enemy steamer. He regained the open sea undamaged."

Rome, October 24th.  
"Our air flights bombarded with visible effects enemy hutments in the area of Fonzaso and large depots in the neighbourhood of the station of Sacile."

Rome, October 25th.  
"Adverse atmospheric conditions completely hindered aerial activity."

Rome, October 27th.  
"Our own and Allied aircraft showed much activity, carrying out powerful bombardment actions in the enemy's lines of communication and gunning repeatedly troops in position and on the march. Ten hostile planes were brought down in air combats. On the railway station of Levico, surprised in full activity, 400 kilogrammes of bombs were dropped last night by one of our airships."

### German

Berlin, October 23rd.  
"Lieut. Burchner obtained his 40th aerial victory."

week in London of the French, Italian, Belgian and British sections of the Inter-Allied Parliamentary Committee were the questions of maintaining Allied air supremacy and the control of aviation after the War. In this connection the two following resolutions were passed:—

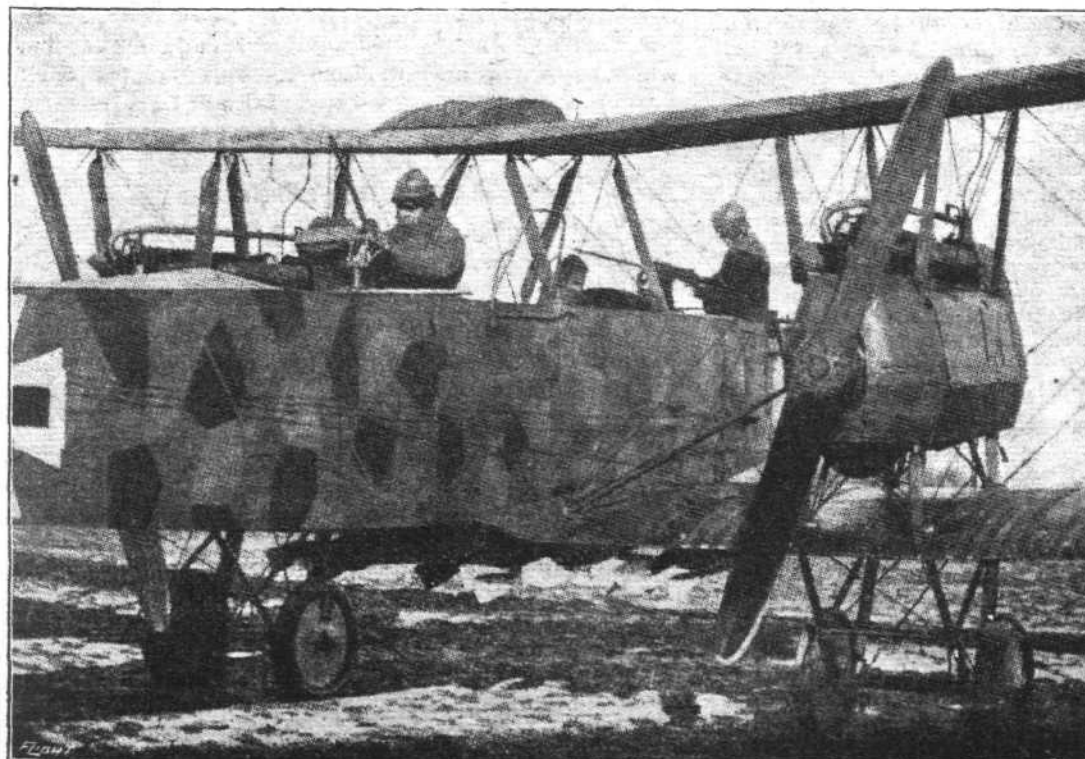
"That the Committee urges upon the Governments associated in the War the necessity of constituting an Inter-Allied Independent Air Force for the purpose of overcoming, if need be, the last resistance of the enemy, by a campaign of raids over his territory, and suggests that the most effective method of accomplishing this would be by common industrial control of the production of aeronautical material."

"That the Committee requests the associated Governments to set up forthwith a commission to make proposals for international aerial legislation, with the subject of organising definite air routes."

### Any Old Rubber?

RUBBER which has completed one term of usefulness is required for naval and military uses and a salvage scheme has been worked out jointly by the Ministry of National Service, the Salvage Department of the War Office and the British Red Cross Society. Old tyres, boots, mats, belts, toys, cushions, &c., can all be made useful again, and a systematic collection is to be started in London, Kent, Sussex and Surrey.

Offers of waste rubber, or offers of assistance from anybody interested in London, Kent, Surrey and Sussex, may be made by letter or postcard, addressed to the Secretary, Ministry of National Service, London and South-Eastern Region, Rubber Salvage, Department, Artillery Mansions, Victoria Street, London, S.W. 1.



Trying the Guns of a German Twin-engine Bomber Before the Start.—Note the camouflage.



## SIDE-WINDS

ONE of the most recent evidences of the interest taken by the administrative heads of producing firms in the recreation of their employees comes from the works of Messrs. Humphries and Dawes, at Hall Green, Birmingham, where, we understand, arrangements have just been completed for a series of half-hour concerts during the mid-day meal hour. These concerts will take place at regular intervals during the week, and the first was successfully organised on a recent Friday. Some 200 employees attended, and this number is bound to increase as the series proceeds. Much excellent talent has been discovered, with the result that there has been formed, in connection with the works, that which will be known as the Humphries and Dawes Choral Society. Over 50 voices are already enrolled, and Mr. Walter Biggin is acting as conductor. The directors have presented this society and concert organisation with a new piano by Russell, of London, and are naturally giving their keenest support to a movement which, if generally encouraged, should be of considerable value to the musical life of the city, and, utilised for such purpose, will no doubt prove a means of providing most beneficial assistance in the entertainment of our soldiers and sailors and others.

On November 7th Mr. Harry Tate has arranged a matinée at the London Hippodrome in aid of the Tank Corps Prisoners of War Fund, under the patronage of the King and Queen. Definite promises of support have been received from many famous artistes, including Mr. George Robey, Mr. Arthur Prince, Miss Violet Loraine, Miss Margaret Cooper, Mr. Harry Weldon, Mr. Harry Dearth, Miss Phyllis Bedells, and in addition the band of the Welsh Guards and the pipers and drummers of the Scots Guards will appear by permission of their respective commanding officers.

It is announced that the controlling interest in Messrs. J. Samuel White and Co., of East Cowes, has been acquired by Mr. Archibald Mitchelson, of Messrs. A. Mitchelson and Co. Messrs. White and Co. won fame many years ago as builders of tea clippers, and some of the early P. and O. liners were turned out from their yards. It has not been disclosed whether the aviation department which turns out the "Wight" seaplane is affected by the transaction, which is said to involve a sum of about half a million.

THE unique and beautiful Vatican picture in mosaic, representing angels appearing over Rome at the time of the Great Plague, which was placed at the disposal of the Imperial Merchant Service Guild by an anonymous lady, to help swell the war funds of this worthy society, has been purchased by Sir Charles Wakefield, Bart.

NOT unnaturally, as might have been expected, the Prodder-Isaac Aviation Company, has, as practical experimental pilots, developed to such an extent as to necessitate increased office accommodation being acquired. The administrative offices have therefore now been removed from 166 Piccadilly, W. 1, to premises at 13 Sackville Street, Piccadilly, W. 1, to which address all future communications should be sent. The Telephone Number remains as before, *i.e.*, Gerrard 278 (two lines), and the Telegraphic Address, "Aeromonia, Piccy, London" is also unchanged, but both are now available for day and night service. The new premises include a well-equipped drawing office, where Mr. Clifford B. Prodder may be personally consulted in connection with aeroplane designs by appointment. The firm are, we understand, now in a position to furnish complete Pilots' Reports on experimental flights or proposed designs, and will survey and submit reports on aerodrome sites and other matters in connection with which a practical pilot's opinion is of value. Mr. Prodder's reputation as a practical experimental pilot is too well known to require further mention here. He is ably assisted by Mr. J. Lancaster Parker, while the business matters of the firm are conducted by Mr. Bernard Isaac.

THE staff and employees of Wycombe Aircraft Constructors, Ltd., held a very successful whist drive and dance at the Town Hall, High Wycombe, on October 15th. The hall was effectively decorated, and the stage was adorned with foliage plants kindly lent by the Marchioness of Lincolnshire. Valuable prizes were given in the whist drive. There was keen competition, and Sergt. Hancock and Mr. Brewer had to cut for the gent's first prize, the former winning. Miss Drake led the ladies, and it was a coincidence that these three players all scored 93. The prizes were distributed by Mr. F. H. Payne (managing director), who was accompanied by Mr. T. E. Ritchie (general manager), Mr. T. Kemp-Walton (secretary), and Mr. D. Stephenson. The proceeds will be given to the Red Cross ("Our Day").

## COMPANY MATTERS

### Whitehead Aircraft (1917), Ltd.

IN a letter just issued to the shareholders of Whitehead Aircraft (1917), Ltd., Mr. J. A. Whitehead, governing director, intimates that the preliminary figures for the year ending September 30th, 1918 (after making ample allowance for depreciation), show that the preference and ordinary dividend has been earned some three times over.

### NEW COMPANIES REGISTERED

EDWARD AND ALEXANDER, LTD., 5 Budge Row, E.C. 4.—Capital £2,000, in £1 shares. Engineers, machine tool makers, manufacturers of woodwork machinery, aircraft and component parts, &c. First directors: E. V. Horsham and A. F. Silcock.

FINSBURY PARK MOTOR WORKS, LTD.—Capital £3,000, in £1 shares. Objects to manufacture, repair, &c., or deal in electric, steam, gas and oil or other engines for motor vehicles, aeroplanes, &c.

WM. THOMLINSON-WALKER, LTD.—Capital £5,000, in £1 shares. Acquiring the business of an iron-founder, engineer, &c., carried on by J. R. Walker, at Victoria Ironworks, Walmgate, Yorks, as "Wm. Thomlinson-Walker," general, aeroplane and motor engineers, &c.

WILSON, WARDEN AND CO., LTD., 28-30, Peartree Street, E.C.—Capital £1,000, in £1 shares. Barometer, meteorological instrument, barograph and appliances manufacturers, &c. First directors: J. M. Wilson, F. Cossor, and Mrs. F. E. Cossor.

### PUBLICATION RECEIVED

*Drapers' Company Research Memoirs: Technical Series VII. Department of Applied Statistics, University of London, University College. London: Cambridge University Press, Fetter Lane, E.C. 4. Price 7s. 6d. net.*

### Aeronautical Patents Published

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m = motors.

Applied for in 1917.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published October 31st, 1918.

10,339. A. V. ROE. Propellers. (119,487.)

### NOTICE TO ADVERTISERS

In order that "FLIGHT" may continue to be published at the usual time, it is now necessary to close for Press earlier. All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages lix, lx, lxi and lxii).

## FLIGHT

and The Aircraft Engineer,

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